

Emergency Action Plan Willett Pond Dam and Dike (Willett & Pettee's Pond)

National ID No.: MA00169

State ID No.: 6-11-220-02



Primary Dam and Dike Owner:

Neponset River Land Holding Association (NRLHA)

Dam and Dike Location: Brook Street and Bullard Street, Norwood and
Walpole, MA (Norfolk County) Norfolk County Conservation District

Last Updated: December 2014

Revision No.: 1

March 2016



78 Interstate Drive
West Springfield, MA 01089

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Security Statement

Information contained in this Emergency Action Plan (EAP) is designed to assist the owner, its agents, and emergency personnel with effectively responding to an emergency situation and to protect persons and/or property downstream of the Willett Pond Dam and Dike in Norwood and Walpole, MA.

Personnel in possession of this Emergency Action Plan are urged to safeguard this copy, and keep it secure, and prevent it from coming into the possession of any unauthorized personnel. This Emergency Action Plan may contain information that could be used to endanger downstream residents and/or property.



Revisions and Updates

Revision Number	Date	Revisions Made	By Whom
1	03/17/2016	Re-formatted content of 07-06-2012 EAP to meet FEMA P-64 (July 2013) and NRCS EAP Fillable Form (June 2007) standards	Ashlee M. Tyce/ Chris Cullen, F&O

Approval of the EAP

PROJECT

Emergency Action Plan
Willett Pond Dam and Dike
Norwood and Walpole, Massachusetts

The following verification of EAP review is required under MGL Chapter 253 and 302 CMR 10.0. This verification of review is to become a part of the Emergency Action Plan and is to accompany the Plan copies submitted to the Department of Conservation and Recreation, Office of Dam Safety and the Massachusetts Emergency Management Agency. The purpose of this verification is to document that the local Emergency Management Coordinators have received and reviewed a draft copy of the Plan, provided comments if necessary, and received a final copy of the Plan.

Signing of this document by the local Emergency Management Coordinators acknowledges that the above described review process has taken place.

EMERGENCY MANAGEMENT DIRECTOR

Name: BERNARD COOPER

Title: Emergency Management Coordinator, Town of Norwood

Signature: Bernard Cooper

Date: 5/12/16

Name: _____

Title: Emergency Management Coordinator, Town of Walpole

Signature: _____

Date: _____

EAP Signatures / Concurrences

By my signature, I acknowledge that I, or my representative, have reviewed this plan and concur with the tasks and responsibilities assigned herein for me and my organization.

1. _____

Signature

Organization

Date

Printed name and title: _____

2. _____

Signature

Organization

Date

Printed name and title: _____

3. _____

Signature

Organization

Date

Printed name and title: _____

4. _____

Signature

Organization

Date

Printed name and title: _____

5. _____

Signature

Organization

Date

Printed name and title: _____

6. _____

Signature

Organization

Date

Printed name and title: _____

7. _____

Signature

Organization

Date

Printed name and title: _____

8. _____

Signature

Organization

Date

Printed name and title: _____



1 Summary of EAP Responsibilities

1.1 Overview of Responsibilities

It is critical that all individuals listed in the notification flowchart understand their responsibilities and are diligent in performing them. The primary owner of the Willett Pond Dam is the Neponset River Land Holding Association (NRLHA). Though a portion of the dam is owned by Norfolk County, ownership of a portion of the dam is in dispute between NRLHA and Norfolk County, and the bridge over the spillway and the top of the spillway abutments are owned by MassDOT. The Dike is owned by NRLHA.

In general terms, the primary dam and dike owner (NRLHA) takes responsibility for developing, maintaining, and implementing the EAP; coordinating long-term maintenance and capital improvements to both the dam and dike; identifying possible emergency conditions at the dam; initiating notification of appropriate emergency management officials as outlined in the Emergency Notification Flowchart; implementing and directing emergency water releases; completing emergency dam/dike stabilization measures and/or emergency repairs; providing regular status updates to emergency management officials as outlined in the Emergency Notification Flowchart; providing technical assistance to emergency management officials when appropriate; and notifying emergency officials when the emergency condition at the dam/dike has terminated.

Local and state emergency management officials are responsible for coordinating an emergency response and for warning and/or evacuating downstream residents, if necessary. Local and state police are responsible for securing the site, controlling traffic into and out of affected areas, and assisting with evacuation activities. NRLHA has stockpiled and/or has identified local construction contractors to provide labor, equipment and materials needed to implement mitigation measures on the dam/dike. The Norwood and Walpole Departments of Public Works may also be asked to supply equipment, materials, and labor in the event of a dam/dike emergency and the necessity of mitigation measures.

In the event of an emergency condition at the Willett Pond Dam and Dike, the Norwood Assistant Town Manager and Emergency Management Coordinator or an assigned representative will assume the primary coordinating role of Incident Commander. If the Norwood Assistant Town Manager and Emergency Management Coordinator are unable to fulfill these duties, the Walpole Emergency Planning Coordinator will be the Incident Commander. If both the Norwood Assistant Town Manager and Emergency Planning Coordinator and the Walpole Emergency Planning Coordinator or designated representatives are unavailable, the Police Chief of either the Town of Norwood or the Town of Walpole will assume the role of Incident Commander.

Any evacuation due to a dam/dike emergency will focus on areas along the stream and low-lying areas, beginning at the dam/dike and extending downstream to Interstate 95. During moderate flooding events (<30 year flood) the Norwood Commerce Center at 61 Endicott St. and Colantuoni Brothers Construction at 77 Davis Avenue are particularly prone to inundation. During design flood events (one-half Probable Maximum Flood) or failure scenarios, the downstream discharge capacity is further



limited by two stone railroad bridges, with relatively small rounded arch openings. The first of these bridges is located immediately downstream of the Norwood Commerce Center on Hawes Brook and the second is located upstream of Pleasant Street on the Neponset River. The primary method of resident notification will be by telephone; however, some properties have unlisted numbers. As such, alternate plans must be in place for contacting downstream citizens. The Massachusetts Emergency Management Agency (MEMA) is responsible for the coordination of broadcast notifications and the National Weather Service, Weather Forecast Office are responsible for broadcasting evacuation notices. It may also be necessary for police to broadcast an emergency notification from their vehicles while driving to residences not reached by phone or residences having special needs. Special needs must be identified ahead of time and plans put in place to address them. Current contact lists for downstream residents must be kept with this EAP to facilitate prompt notification of the citizenry.

The specific responsibilities of key participants in the planning, implementation, and execution of the EAP are outlined in the following sections.

1.2 Primary Dam/Dike Owner

NRLHA

- Distribute this EAP to the appropriate Control Copy Holders (Primary Owner, MADCR, MEMA, Norwood EMD, Walpole EMD).
- Review this EAP at least once a year and make revisions as needed.
- Provide revised pages and a revision summary to all EAP Control Copy Holders.
- Conduct ongoing surveillance, inspection and maintenance of the Dam/Dike.
- As soon as an emergency event is observed or reported, immediately determine the emergency level (see *Section 5.1*).
 - Level 1: Unusual Condition – Unusual event, slowly developing
 - Level 2: Early Warning – Potential dam/dike failure situation, rapidly developing
 - Level 3: Final Warning – Dam/dike failure appears imminent or is in progress
 - Non-Failure Emergency Condition (High Flow) – Treat as Level 1, 2, or 3 as appropriate
- Immediately notify the personnel in the order shown on the Emergency Notification Flowchart for the appropriate level (see *Section 2*).
- Implementation and direction of emergency water releases, emergency Dam/Dike stabilization measures and/or emergency repairs.

- Provide regular status updates of the situation to the incident commander to assist them in making timely and accurate decisions regarding warnings and evacuations.
- Provide technical assistance to emergency management officials when appropriate.
- Notifying emergency officials when the emergency condition at the dam/dike has terminated.

1.3 Incident Commanders

Town of Norwood Assistant Town Manager and Emergency Management Coordinator and the Town of Walpole Emergency Management Coordinator

- Primary contacts for coordinating municipal review of EAP.
- Serve as the primary contact person responsible for coordination of all emergency actions.
- When a Level 2 situation occurs:
 - Prepare emergency management personnel for possible evacuations that may be needed if a Level 3 situation occurs.
 - Initiate early warning for people at risk downstream of the dam/dike.
- When a Level 3 situation occurs:
 - Initiate final warning and order evacuation of people at risk downstream of the dam/dike.
 - Notify local emergency management services to carry out the evacuation of people and close roads within the evacuation area (see *Section 4.5*).
- Decide when to terminate the emergency.

1.4 Emergency Management Services

Town of Norwood and Walpole Police Departments with cooperation from Town of Norwood and Walpole Fire Departments

- Lead agencies directing local responses during an actual emergency.
- Determining when to initiate evacuation of downstream areas.



- Implementing and directing all aspects of the evacuation of downstream areas.
- Maintain communication with media and verifying emergency conditions for the National Weather Service prior to broadcasting an evacuation notice.
- When a Level 2 situation occurs:
 - Prepare emergency management personnel for possible evacuations that may be needed if a Level 3 situation occurs.
 - Assist the Incident Commander in alerting the public of the developing situation, as appropriate.
- When a Level 3 situation occurs:
 - Assist the Incident Commander in alerting the public.
 - Immediately close roads and evacuate people within the evacuation area (see *Section 4.5*).
- Termination of emergency declaration and emergency response activities off-site.
- Participate in an annual review and update of the EAP.

1.5 Dam/Dike Operator's (NRLHA) Technical Representatives

Fuss & O'Neill, Inc.

- Provide technical assistance to NRLHA staff for the evaluation of emergency conditions as needed.
- Advise the dam operator regarding the emergency level determination, if time permits.
- Advise the dam operator of remedial actions to take and the implementation of mitigation measures if Level 2 event occurs, if time permits.

1.6 Dam/Dike Operator's (NRLHA) Construction Contractors

- Provide labor, equipment and materials as needed to implement mitigation measures as needed.



1.7 State Dam Safety Agency

Massachusetts DCR Office of Dam Safety

- Advise the dam/dike operator regarding the emergency level determination, if time permits.
- Advise the dam/dike operator of remedial actions to take if Level 2 event occurs, if time permits.
- Require dam/dike owner's representative to maintain this EAP.

1.8 State Police

Massachusetts State Police

- **At the request of the local Police Department, assist in securing the site, controlling traffic into and out of Walpole, and implementing an evacuation.**

1.9 Massachusetts Bay Transportation Authority

MBTA Transit Police

- In the event that stability of rail lines with undersized culverts are threatened, coordinate management of MBTA rail traffic and rail traffic by all other carriers.
- Coordinate implementation of any mitigation measures involving the undersized railroad culverts.

1.10 State Emergency Management Agency

Massachusetts Emergency Management Agency (MEMA)

- Serve as a planning resource to assist in developing and maintaining an effective emergency plan.
- Conduct training seminars for first responders, as required.
- At the request of the Incident Commander, assist with public notification through broadcasts, mobilize necessary equipment and resources, and assist with the aftermath of a dam/dike breach or flood scenario.

1.11 National Weather Service

National Weather Service, Weather Forecast Office

- Provide weather data and forecasts.
- Broadcast evacuation notices.

1.12 Norwood and Walpole

Norwood and Walpole Departments of Public Works

- Provide labor, equipment and material assistance to other Departments as needed for implementation of an evacuation or implementation of mitigation measures.

Norwood and Walpole Town Engineers

- Provide technical assistance to other Departments as needed for implementation of an evacuation or implementation of mitigation measures.

Norwood and Walpole Town Administrators

- Assist with the coordination of local and state emergency response efforts as needed.

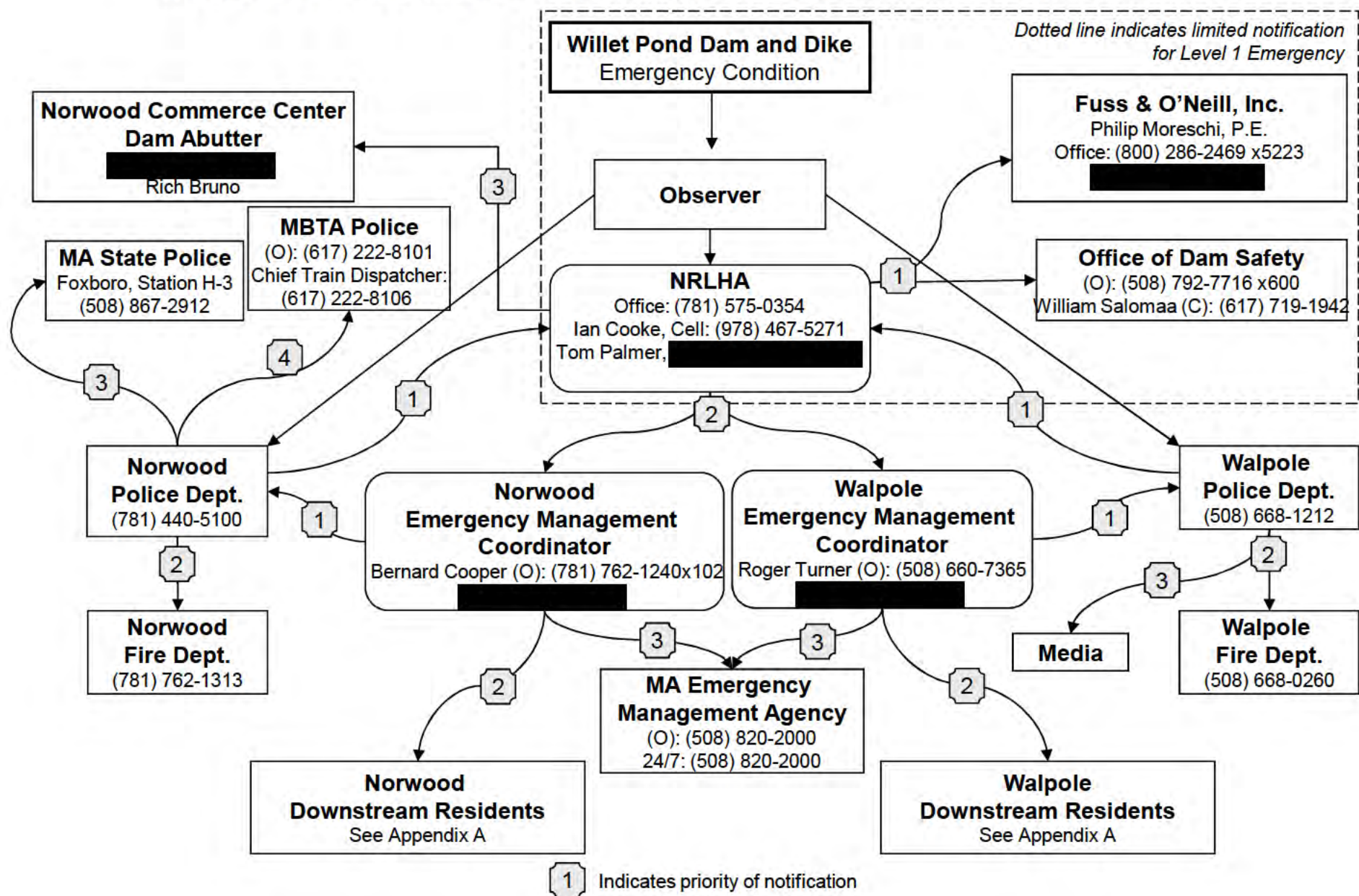
2 Notification Flowcharts

In the event of an emergency condition at the Willett Pond Dam or Dike, it is critical that an alert be issued immediately to the NRLHA, the Town of Norwood and Walpole Incident Commanders, the Town of Norwood and Walpole local emergency management officials, federal and state emergency management agencies, downstream residents and property owners, operators of downstream dams, the news media, and others. A notification flowchart is included on the following page showing who is to be notified, by whom, and in what priority. After the emergency level has been determined, the people on the notification chart shall be notified immediately.

A more limited notification process may be appropriate if dam/dike failure is not considered imminent and emergency repair efforts are more appropriate (i.e. Level 1 Emergency). This is shown as the portion of the Notification Flowchart within the dotted line. If failure is imminent or has occurred, then full notification and immediate evacuation of the inundation area is required.

A list of downstream property owners is included as Appendix A.

WILLET POND DAM AND DIKE NOTIFICATION FLOWCHART



3 Statement of Purpose

The purpose of this Emergency Action Plan (EAP) is to minimize the danger to lives and property that would occur in the unlikely event of an uncontrolled release of water due to the failure of the Willett Pond Dam and/or Dike.

The EAP is a management document intended to be read, understood, tested, and updated before an emergency condition occurs. It is designed to outline the activities of the NRLHA as well as local and state emergency management officials within the framework of existing, in-place emergency management systems. This plan formalizes procedures for identifying and evaluating actual or potential emergency conditions in time to implement mitigation responses and notify appropriate emergency management officials. It also outlines mitigation measures that may need to be implemented to prevent or minimize Dam or Dike failure during emergency situations. Additionally, it identifies the downstream areas likely to be affected in the event of Dam or Dike failure in order to facilitate an orderly evacuation. Finally, it provides the planning basis for recovery and training/testing.

This Emergency Action Plan (EAP) has been prepared in fulfillment of the requirements of the Commonwealth of Massachusetts General Laws c. 253, § 44, and Code of Massachusetts Regulations c. 302 § 10, "Dam Safety".

The EAP should be periodically reviewed and updated to reflect changes in contact information and/or changes to the downstream properties.

3.1 Scope

This EAP sets forth basic procedures, roles, and responsibilities to be implemented by NRLHA and the Towns of Norwood and Walpole and outlines the involvement of key public safety personnel in the event of an emergency condition at the Willett Pond Dam and/or Dike.

The EAP includes information and procedures to:

- Identify emergency conditions at the dam
- Take mitigation actions to try to prevent failure of the dam
- Notify the appropriate emergency management officials of possible, impending, or actual failure of the dam
- Reduce loss of life and property should a failure of the dam occur
- Provide lists of people and materials for carrying out response actions
- Prepare and train for an emergency event

It also contains maps and lists identifying threatened populations based on a hypothetical dam or dike breach flood analysis, to be used in emergency planning.

This document draws heavily on material provided in the Federal Emergency Management Agency (FEMA) “Federal Guidelines for Dam Safety: Emergency Action Planning for Dams” (dated July 2013) and the Natural Resources Conservation Service (NRCS) “EAP Fillable Form” (dated June 2007).

3.2 Limitations

This plan has been prepared for the exclusive use of NRLHA (dam/dike owner/operator), for specific application to Willett Pond Dam and Dike located in Norwood and Walpole, Massachusetts. It is intended for use only in dam/dike emergency situations and in case of flooding downstream of the dam/dike, and does not address other emergency operations. This plan should be used in conjunction with established policies and procedures in the Towns of Norwood and Walpole.

The dam/dike breach analysis and inundation area shown on the Inundation Maps included in this document reflect events that have never occurred and are expected to occur only in very rare circumstances. They are not in any way intended to reflect upon the integrity of the Willett Pond Dam and Dike.

The flood inundation areas indicated on *Figures 6 through 13* are based on computer analyses for the breach scenarios described herein. The estimated flood waves and resulting inundation areas have not been identified for conditions other than those analyzed. The results are a function of the method, procedures, and assumptions employed for the model. Accordingly, the limits of flooding presented are approximate and should be used by public safety personnel only as a guideline for establishing emergency notification and evacuation zones. Actual inundation areas will depend on actual failure conditions and may differ from the areas indicated.

The condition of a dam/dike depends on numerous and constantly changing internal and external factors and changes with time. It would be incorrect to assume that the present condition of the dam/dike will continue to represent the dam/dike’s future condition. Continued care and monitoring is necessary for detection of unsafe conditions.

4 Project Description

The following sections contain a description of the project including location, directions, physical description, and a discussion of downstream hazards. Note that the terms “right” and “left” in reference to the dam assume the reader is facing in the downstream direction.

4.1 Dam Location

Willett and Pettee’s Ponds (the “Ponds”) are located in Walpole, Westwood and Norwood. The Ponds were created in 1913 to serve as a water supply for the Winslow Brothers and Smith tannery located downstream in Norwood. Together the Ponds create a pool with an area of approximately 208 acres and a maximum length of roughly one and a quarter mile. A 1913 bathymetric survey indicates that the Ponds hold 767 million gallons (2,353 acre-feet) at high water. The 2009 Fuss &

O'Neill Phase I Dam Inspection Report gives the normal volume as 566 million gallons (1736 acre-feet) and maximum capacity as 815 million gallons (2500 acre-feet).

The Ponds were created through the construction of the Willett Pond Dam (the “Dam”) and the Willett Pond Dike (the “Dike”). These two structures function as an integrated system to impound water at the Ponds (see figure on next page).

The Dam runs north to south across the Walpole-Norwood Town line for 900 feet immediately to the south of what is now St. Timothy's Church. A street runs across the top of the dam and is named Brook Street in Norwood and Bullard Street in Walpole. Willett Pond Dam and Dike are located in Norfolk County, Massachusetts, approximately 2.5 miles southwest of Norwood Center and 3.3 miles north of Walpole Center. Water enters the pond through several tributary streams, the largest of which are Mill Brook and Bubbling Brook. Water exits the Ponds via a spillway that routes flow downstream into Hawes Brook in Norwood. The Brook passes through several smaller impoundments as it heads downstream—most notably Ellis Pond—before joining with the main stem Neponset River approximately 1.5 miles downstream. The coordinates of the dam are 42.181765° North 71.232832° West (WGS 84 Datum), as determined using Google Earth geographic information software. A locus map is included as *Figure 1* and an aerial photograph as *Figure 2*.

The Dike is located about 400 feet south of the Dam in Walpole. The Dike also runs in a north to south direction parallel and to the west of Bullard Street. The coordinates of the dike are 42.176529° North 71.232665° West (WGS 84 Datum) (Google Earth).

Both the dam and dike can be easily accessed from Brook Street from the north or Bullard Street from the south. However, during a dam emergency this roadway may not be safe as this street runs along top of the dam (the crest) and its spillway. The Saint Timothy's Church just north of the dam on Brook Street may be a more suitable location for staging of people and equipment.

4.2 Directions to Dam/Dike

A Locus Map is provided as *Figure 1*. Two sets of directions are provided.

- From Walpole: Beginning at the intersection of Route 1A and Route 27, travel northeast on MA-1A N/Main Street for 1.9 miles. Turn left on Bullard Street for 0.4 miles. On the left, just north of 159 Bullard Street an access easement to the dike exists. To access the dam continue 0.5 miles to where Bullard Street becomes Brook Street. It is at this location where Bullard Street turns into Brook Street that the dam is located.
- From Norwood Common: Head northwest on Nathan Street toward Maple Street for 0.2 miles. Take a left onto Nichols Street and continue 0.8 miles. At the traffic circle, continue straight to stay on Nichols Street for an additional 1.2 miles. At the traffic circle take the third exit onto Brook Street and in 0.2 miles the roadway will pass over the dam. Saint Timothy's Church, where the staging of people and equipment is recommended, is located just north of the dam on Brook Street. To access the dike from the dam continue south on Brook Street for 0.1 miles,

where it will turn into Bullard Street. Continue approximately 0.6 miles south on Bullard Street and access to the dike can be gained via an access easement just north of 159 Bullard Street.

4.3 Description of Dam and Appurtenances

Willet Pond Dam is classified by the state as a large size, high hazard potential class dam. The Dam is constructed of earth fill with a concrete core wall. The crest elevation of the dam varies from 144.5 feet to 145.1 feet with an overall maximum structural height of approximately 25 feet. The dam includes a spillway, which is the primary discharge point for the pond. The spillway openings total 24.9 feet wide. The spillway is equipped with 2.2 feet of removable stop logs with the top at 139.85 feet, creating a hydraulic height of approximately 20 feet when all the boards are installed. A bridge carries the street over the spillway and the bridge abutments define the lateral width of the spillway.

The low level outlet for the dam consists of two 20-inch pipes extending through the dam. Valves, operated manually from within a brick gatehouse, discharge below the dam via a Parshall flume.

Basic data for the dam is summarized as follows:

Maximum Height: 25 ft	Drainage Area: 4.8 sq mi
Built (Re-built): 1913	Hazard Classification: High
Normal Pool Surface Area: 208 acres	Max Storage: 2,500 acre-feet
Legal Description: Unknown	Dam Operator: NRLHA
Lat./Lon: 42.181765°/-71.232832°	Property Owner: NRLHA/Norfolk County
NID No.: MA00169	Dam Designer: Unknown

The Dike is approximately 1900 feet long with a maximum structural height of 14 feet and a crest elevation which varies from approximately 142.5 feet to 143.3 feet. Similar to the Dam, the Dike is constructed of earth fill with a concrete core wall. There are no spillways or other outlet structures on the dike. A row of homes sits between the Dike and Bullard Street. Maintenance access to the Dike is via an access right-of-way located at the south end of the structure or with the consent of other abutting private property owners.

Basic data for the dike is summarized as follows:

Maximum Height: 14 ft.	Length: 1900 ft.
Built (Re-built): 1913	Crest Elevation: 142.5 ft-143.5 ft.
Lat./Lon: 42.176529°/-71.232665°	Dike Operator: NRLHA
Dike Designer: Unknown	Property Owner: NRLHA

4.4 Potentially Impacted Areas

Additional engineering data for the dam/dike and reservoir, as well as a sketch of the dam/dike, are included in *Appendices D* and *E*.

The Dike is owned by the Neponset River Land Holding Association (the “NRLHA”), though ownership generally extends only to the downstream toe of the dike and not beyond. Much of the Dam, including the floor of the spillway, the flashboards and the valve house, is owned by the NRLHA. In the mid 1960’s Norfolk County took most of the Dam in the Town of Norwood by eminent domain. Subsequently, the County returned part of the taking area to the NRLHA’s predecessor. The portion of the Dam that was taken but *not* returned includes a large section of the northern end of the Dam. Ownership of the portion which was returned is in dispute; however the ownership of the disputed area is not immediately relevant to the substance of the EAP. In 2006 the Mass Highway Department rebuilt the Bridge over the spillway, taking the bridge structure and bridge abutments by eminent domain.

4.5 Downstream Roadways and Railroads

The presence of the two large railroad embankments in the downstream reaches has a significant impact on the extent of the inundated area. Unlike bridges which tend to have large openings and, therefore, greater hydraulic capacity, the arch culverts at these structures are relatively small and have lesser capacity to convey large flows. Furthermore, the height and length of the embankments allows a large volume of water to be impounded behind these structures in the event that the culverts become overwhelmed. The design and construction specifications of these embankments are not known; however, structures such as this are not typically designed to safely impound water or to resist erosive forces in the event that they are overtopped.

The possibility of a failure of the downstream railroad embankments was evaluated as part of the sunny day failure analyses for the Dam and the Dike. The results of both of the failure analyses indicated that these structures would not be overtopped; therefore, it was assumed that these structures would not be breached. In the design storm failure scenario (half probable maximum flood) modeling indicates that the railroad bridge just downstream of the Norwood Commerce Center will overtop, and it is assumed that this railroad bridge would breach under these circumstances.

In the scenario of a dam and/or dike breach the following roads and railroads lie all or in part within the downstream inundation area. Those in bold text cross the downstream waterway, via a bridge or culvert. Below is a list of roads to be evacuated during an emergency. *Appendix A* includes residents, buildings, and highways at risk in the case of a dam and/or dike failure.

During a catastrophic failure of Willett Pond Dam and/or Dike, bridges on these streets are at risk of failure. Therefore, they may be impassible to local, interstate, and/or emergency traffic. Emergency management authorities should prepare plans for closing these streets in the event of a large flood or dam/dike emergency.

Norwood

- Morningside Drive
- Lancelot Court
- Nichols Street
- George F Willett Parkway
- Orleans Road
- Davis Avenue
- Cedar Avenue
- King Court
- Jason Court
- West Road
- Village Road Way
- Wickham Way
- Lansdowne Way
- Buckminster Drive
- Frederick Court
- Engamore Lane
- Anson Court
- Colin Court
- Camon Court
- Eric Court
- Byron Court
- Ivy Circle
- Endicott Street
- Walpole Street (MA Route 1A)
- Holly Drive
- Laurel Road
- Woodbine Road
- Lane Drive
- Conrail Embankment (Hawes Brook) (Railroad)
- Valley Road
- Wood Drive
- Cedar Street
- Lewis Avenue
- Washington Street
- Dean Street
- Sturtavant Avenue
- Pond Avenue
- Baker Avenue
- River Street
- Oolah Avenue
- Andrus Place
- Cedar Street

- Katie's Way
- Weld Avenue
- Heaton Avenue
- St James Avenue
- St George Avenue
- Atwood Avenue
- Austin Avenue
- Hartford Street
- Tremont Street
- Folan Avenue
- Concord Avenue
- Alandale Parkway
- St John Avenue
- St Joseph Avenue
- St Paul Avenue
- Stuart Street
- Morse Street
- Riverside Court
- Conrail Embankment (Neponset River) (Railroad)
- Pleasant Street
- Pellana Road
- Kerry Place
- Industrial Way
- Providence Highway (MA Route 1)
- I-95

In the scenario of a dike breach the following additional roads lie all or in part within the downstream inundation area.

Walpole

- Bullard Street
- Mert Street

Norwood

- Garden Parkway
- Arcadia Road
- Countryside Lane
- Dell Road
- Fieldbrook Drive
- Old Derby Road

4.6 Upstream and Downstream Dams

The upstream watershed contains a number of small dams all of which are either very small or have limited impoundment capacity and are not expected to materially impact the operation of the Willett Pond Dam or Dike during the design storm event.

The following dams are located on the Hawes Brook downstream of Willett Pond Dam:

- Guild Pond Dam (Non-jurisdictional)
- Ellis Pond Dam (High Hazard)
- Soap Mill Pond Dam (Non-jurisdictional)

It was assumed that due to the magnitude of the flood wave and the extent of the inundated area caused by failure of the Willett Pond Dam or the Dike, potential dam breaches at the Guild Pond Dam, Ellis Pond Dam, and Soap Mill Pond Dam would have no material effect on the extent of flooding.

5 EAP Response Process

There are generally four steps that should be followed when an unusual or emergency incident is detected at a dam. These steps constitute the EAP response process. The steps are outlined in the following sections.

5.1 Step 1: Incident Detection Evaluation and Emergency Level Determination

This step describes the detection of an unusual or emergency event and provides information to assist the dam/dike operator in evaluating and determining the appropriate emergency level for the event.

See *Section 5.1.3.5* for assistance in evaluating specific events to determine if they are unusual or potential emergency situations.

5.1.1 Incident Detection

Unusual or emergency events may be detected by:

- Inspections or observations made at the dam/dike by the dam/dike owner or operator
- Observations at or near the dam/dike by government personnel (local, state, or federal), abutters, motorists, visitors to the dam/dike, or the public
- Evaluation of instrumentation data
- Earthquakes felt or reported in the vicinity of the dam/dike
- Forewarning of conditions that may cause an unusual event or emergency event at the dam/dike, e.g. a severe weather (substantial rainfall or flood) forecast

Emergency conditions at the dam/dike may be caused by any number of occurrences including but not limited to:

- Unusually high flood flows
- Vandalism
- Seepage/erosion
- Earthquake
- Spillway blockage

The most probable failure mechanism is overtopping of the dike due to flooding. Such flooding is caused by excessive precipitation; however, the potential exists for the dike to overtop if at least one of the following conditions exist:

- Periods of unusually heavy or intense rainfall
- Excessive snow melt and/or frozen ground conditions
- Back-to-back rainfall events resulting in high antecedent water surface elevations
- Additionally, a flood that does not overtop the dike but results in very high levels of discharge through the dam spillway may be severe enough to warrant initiation of this EAP to assist first responders, even if a failure of the dam/dike is not expected.

It is important to note that the magnitude of flood flows generated by a given rain event is NOT solely dependent on the depth of precipitation. Factors that may increase flooding include, but are not limited to, wet antecedent conditions in the watershed (i.e., saturated ground), frozen ground, snow melt, reduced storage volume in upstream impoundments, etc.

5.1.1.1 Periodic Inspections

Frequent inspections of Willett Pond Dam and Dike can help identify deficient conditions at the dam so they can be addressed early. A Phase I formal inspection of Willett Pond Dam and Dike is required every two years by 302 CMR 10.07 (2). As part of this inspection process, recommendations are made by a professional engineer concerning maintenance and/or repair requirements.

It is important that, in addition to the formal inspection process involving a professional engineer, that NRLHA frequently inspect the condition of the dam, looking for any conditions that might warrant further inspection or action. Some typical conditions include the following:

- Abnormal rise in water elevation threatening overtopping
- Cracking of the dam and/or dike surface
- Slumping of earth at the dam and/or dike
- Abnormal discharge of water at the downstream side of the dam and/or dike
- Piping or boils on the downstream slope or toe or either the dam and/or the dike

5.1.1.2 Flood Event Inspections

When high runoff conditions are forecast, commence inspections at the following frequency:

- **When the National Weather Service (the “NWS”) issues a Flood Watch or Flood Warning** for the area, NRLHA staff begin closely monitoring NWS quantitative precipitation forecasts, real-time precipitation data and weather radar, at least once every four hours.
- **Once the NWS forecasts precipitation accumulations of 5 or more inches over 24 hours**, the spillway is inspected at least once every 8 hours to check and record water levels and confirm that the spillway is clear.
- **If the weather continues to intensify**, more frequent inspections will be initiated as detailed in the NRLHA Water Management Procedure provided in Appendix J.
- **Post Event:** Subsequent inspections should be made after the ground has dried sufficiently to allow for the identification of any new seepage areas in the vicinity of the dam/dike which could indicate the loss of or shifting of structural material within the structure.

A written record should be maintained of any observations made during the inspection. These procedures should be updated to reflect any future repairs or modifications at the site.

All inspections should be performed with proper equipment and means of remote communication with emergency officials. Refer to *Section 7* for additional information.

5.1.2 Incident Evaluation

If a deficiency or condition is identified at or near the dam and/or dike, it will be evaluated to determine whether it constitutes an emergency. The technical evaluation of a potential emergency condition is best accomplished by someone familiar with conditions that would trigger failure, typically a professional engineer involved with the design and/or inspection of earthen embankment dams/dikes.

Please note that in certain rare situations the amount of time required for an engineer to reach the site may exceed the amount of time available. In these situations, the owner may be required to assess the situation independent of this professional assistance.

Therefore, if time allows, the typical procedure for identifying emergency conditions threatening Willett Pond Dam and Dike would be:

- For the owner to contact emergency management services (on the notification Flow Chart) and inform the dispatcher that a potential emergency condition is arising with the dam, **but wait to mobilize emergency personnel until the owner speaks to an engineer and calls emergency management services a second time.**



- **Notify the professional engineer(s)** who are most familiar with the dam/dike as listed on the Notification Flowchart at the beginning of this Plan.
- **Call emergency management services again and state the results of the determination;** whether initiation of the EAP is necessary and constitutes a Level 2 or Level 3 emergency (see *Section 5.3 below*), or whether the condition is in fact not an emergency.

Emergency Action Plan initiation is performed by the dam owner (typically upon the advice and recommendation of a registered professional engineer), and can be a controversial decision. The issue should not be debated too long. An early decision and declaration are critical to maximize available response time. Note that the decision to actually initiate an evacuation is the responsibility of local emergency management officials.

When possible, the following steps should be taken in the order listed below to observe the condition of the dam/dike during a storm event and to issue warnings if deemed necessary.

1. Rate of water level rise: Check the water level relative to the spillway crest. Make a visual observation of the rate at which the water is rising, or make a record of several periodic observations to estimate the rise. It may be helpful to place stakes with flagging tape at the water level high points during each check so the water level change can be easy to observe.
2. Erosion: Check the condition of earth embankment of the dam, the abutments and the dike for erosion. If rills or gullies are forming in these areas erosion could quickly escalate to cause a breach.
3. Seepage, soft spots, slumping: Check the downstream slope and downstream toe of the dam and dike for signs of seepage, soft spots or slumping of earth material on the slope.
4. Concrete Structures: If conditions permit the inspector to approach the primary spillway and low level outlet discharge safely, check for cracking, settlement, or movement of the structures and the surrounding embankment and abutment.
5. Other Conditions: Check for any other conditions at the dam/dike that may result in or indicate failure of the dam (e.g. bulging, cracking, change in horizontal or vertical alignment).

Refer to the following section for guidance in determining the emergency notification level.

5.1.3 Emergency Level Determination

After an unusual or emergency event is detected or reported, the dam/dike operator's representative is responsible for classifying the event into one of the following three emergency levels outlined below. It should be noted that it is often very difficult to determine and classify an emergency situation, as declaring an emergency is a controversial decision to make. In emergency situations it is important to not waste time debating over how to react. Early decisions and declarations are important in taking the appropriate actions and quickly addressing the emergency. It is important that the emergency classification terms are agreed upon by all involved parties to allow everyone to respond appropriately.



5.1.3.1 Emergency Level 1: Unusual Condition – Nonemergency, Unusual Event, Slowly Developing

Emergency Level 1 represents a situation that is not normal but has not yet threatened the operation or structural integrity of the dam/dike, but possibly could if it continues to develop. The dam/dike operator's technical representatives should be contacted to investigate the situation and recommend actions to take. The condition of the dam should be closely monitored, especially during storm events, to detect any development of a potential or imminent dam/dike failure situation. The incident commander should be informed if it is determined that the conditions may possibly develop into a worse condition that may require emergency actions.

5.1.3.2 Emergency Level 2: Early Warning – Potential Dam Failure Situation, Rapidly Developing

Emergency Level 2 represents a situation that may eventually lead to dam/dike failure and flash flooding downstream, but there is not an immediate threat of dam/dike failure. The incident commander should be notified of this emergency situation and placed on alert. The dam/dike operator should closely monitor the condition of the dam/dike and periodically report the status of the situation to the incident commander. If the dam/dike condition worsens and failure becomes imminent, the incident commander must be notified immediately of the change in the emergency level to evacuate the people at risk downstream.

If time permits, the dam/dike operator's technical representatives should be contacted to evaluate the situation and recommend remedial actions to prevent failure of the dam and/or dike. The dam/dike operator should initiate remedial repairs (note local resources that may be available—see *Appendix B*). Time available to employ remedial actions may be hours or days.

5.1.3.3 Emergency Level 3: Final Warning – Urgent; Dam Failure Appears Imminent or Is in Progress

Emergency Level 3 represents an extremely urgent situation when a dam and/or dike failure is occurring or obviously is about to occur and cannot be prevented. Flash flooding will occur downstream of the dam/dike. The incident commander should be contacted immediately so emergency services can begin evacuations of all at-risk people and close roads as needed (see *Figures 6 through 13* for inundation mapping and *Appendix A* for list of downstream properties).

5.1.3.4 Non-Failure Emergency (High Flow) Condition

There may be times when there is no danger of dam/dike failure, but flow conditions are such that significant flooding is expected to occur downstream of the dam. Non-failure emergency conditions are more common than failure emergency conditions. Activation of the EAP will provide an early warning to downstream areas during flood conditions or large spillway releases. Therefore, an important

application of the EAP is when there is a flood occurring on the river system, but there may be no apparent threat to the integrity of the dam/dike. In this situation, natural flooding is expected or is in progress upstream from the dam/dike site, and an impending or actual release of water to downstream areas will result from unusually large spillway releases or passage of unusually large flows at dams having uncontrolled spillways. The dam/dike owner can provide an important public service by notifying the appropriate agencies of the expected release or passage of flood waters below the dam. While the amount of flooding may be beyond the control of the dam/dike owner, information on the amount of releases from the dam will be very helpful to the authorities in reaching any decisions on the need for evacuation.

A Non-Failure Emergency Condition may be treated as a Level 1, 2 or 3; emergency notification as appropriate.

See the following pages for guidance in determining the proper emergency level for various situations.

5.1.3.5 Guidance for Determining the Emergency Level

Event	Situation	Emergency Level*
Spillway Flow	Spillway flow with <u>limited</u> damage, loss of embankment material adjacent to or underneath spillway, head-cutting or undercutting	1
	Spillway flow with <u>progressive</u> damage, loss of embankment material adjacent to or underneath spillway, head-cutting or undercutting	2
	Spillway flow that could result in flooding of people downstream if the reservoir level continues to rise	2
	Spillway flow with <u>advanced</u> damage, loss of embankment material adjacent to or underneath spillway, head-cutting or undercutting that is threatening the control section	3
	Spillway flow that will begin flooding people downstream	3
Embankment overtopping	Reservoir level is rising and could overtop the dike within 3 hours	2
	Reservoir level is rising and has reached less than 1 foot below top of the dike, and/or the dike could overtop within 1 hour	3
Seepage	New seepage areas in or near the dam/dike	1
	New seepage areas with cloudy discharge or increasing flow rate	2
	Seepage with discharge significantly greater than previously observed	3
Sinkholes	Observation of new sinkhole in reservoir area or on embankment	2
	Rapidly enlarging sinkhole	3
Embankment cracking	New cracks in the embankment greater than 1/4-inch wide without seepage	1
	Cracks in the embankment with seepage	2
Embankment movement	Visual movement/slippage of the embankment slope	1
	Sudden or rapidly proceeding slides of the embankment slopes of either the dam and/or dike	3
Instruments	Instrumentation readings beyond predetermined values	1

Event	Situation	Emergency Level*
Earthquake	Measurable earthquake felt or reported within 50 miles of the dam/dike	1
	Earthquake resulting in visible damage to the dam or appurtenances	2
	Earthquake resulting in uncontrolled release of water from the dam	3
Security threat	Verified bomb threat that, if carried out, could result in damage to the dam/dike	1
	Damage to dam/dike or appurtenances with no impacts to the functioning of the dam/dike	2
	Detonated bomb that has resulted in damage to the dam/dike or appurtenances	3
Sabotage/ vandalism	Damage to dam/dike or appurtenance with no impacts to the functioning of the dam/dike	1
	Modification to the dam/dike or appurtenances that could adversely impact the functioning of the dam/dike	1
	Damage to dam/dike or appurtenances that has resulted in seepage flow	2
	Damage to dam/dike or appurtenances that has resulted in uncontrolled water release	3

* Emergency Level 1: Unusual Condition – Nonemergency unusual event, slowly developing

* Emergency Level 2: Early Warning – Potential dam/dike failure situation, rapidly developing

* Emergency Level 3: Final Warning – Urgent; dam/dike failure appears imminent or is in progress

5.1.3.6 Examples of Emergency Situations

The following are examples of conditions that usually constitute an emergency situation that may occur at a dam/dike. Adverse or unusual conditions that can cause the failure of a dam/dike are typically related to aging or design and construction oversights. Extreme weather events that exceed the original designed conditions can cause overtopping of the embankment. However, accidental or intentional damage to the dam/dike may also result in emergency conditions. The conditions have been grouped to identify the most likely emergency-level condition. The groupings are provided as guidance only. Not all emergency conditions may be listed, and the dam/dike operator is urged to use conservative judgment in determining whether a specific condition should be defined as an emergency situation at the dam/dike.

Spillway Flows

Emergency Level 2—Potential dam failure situation; rapidly developing:

1. Significant erosion, undercutting or head cutting is occurring in the spillway or the discharge channel downstream of the spillway, but the rate does not appear to threaten an imminent breach of the spillway area that would result in an uncontrolled release of the reservoir.
2. Flow through the spillway is or is expected to cause flooding that could threaten people, homes, and/or roads downstream from the dam.

Emergency Level 3—Urgent; dam failure appears imminent or is in progress:

1. Significant erosion, undercutting or headcutting of the spillway or the discharge channel downstream of the spillway is occurring at a rapid rate, and a breach of the control section appears imminent.
2. Flow through the spillway is causing flooding that is threatening people, homes, and/or roads downstream from the dam.

Embankment Overtopping**Emergency Level 2: Potential dam/dike failure situation; rapidly developing**

1. The impoundment level is rising and is one foot from the top of the dike or could overtop within 3 hours.

Emergency Level 3: Urgent; dam/dike failure appears imminent or is in progress

1. The impoundment level is rising and has reached less than 1 foot from the top of dike, and/or will overtop the dike within 1 hour.

Seepage and Sinkholes**Emergency Level 2: Potential dam/dike failure situation; rapidly developing**

1. Cloudy seepage or soil deposits are observed at seepage exit points. New or increased areas of wet or muddy soils are present on the downstream slope, abutment, and/or foundation of the dam/dike, and there is an easily detectable and unusual increase in volume of downstream seepage.
2. Significant new or enlarging sinkhole(s) near the dam/dike or settlement of the dam/dike is observed.
3. Impoundment level is falling without apparent cause.
4. The following dam/dike defects, if they exist, are or will soon be inundated by a rise in the impoundment:
 - Sinkhole(s) located on the upstream slope, crest, abutment, and/or foundation of the dam/dike; or
 - Transverse cracks extending through the dam/dike, abutments, or foundation.

Emergency Level 3: Urgent; dam/dike failure appears imminent or is in progress

1. Rapidly increasing cloudy seepage or soil deposits at seepage exit points to the extent that failure appears imminent or is in progress.
2. Rapid increase in volume of downstream seepage to the extent that failure appears imminent or is in progress.
3. Water flowing out of holes in the downstream slope, abutment, and/or foundation of the dam/dike to the extent that failure appears imminent or is in progress.
4. Whirlpools or other evidence exists indicating that the reservoir is draining rapidly through the dam, the dam's foundation or the dike.
5. Rapidly enlarging sinkhole(s) are forming on the dam/dike or abutments to the extent that failure appears imminent or is in progress.
6. Rapidly increasing flow through crack(s) eroding materials to the extent that failure appears imminent or is in progress.

Embankment Movement and Cracking**Emergency Level 2: Potential dam/dike failure situation; rapidly developing**

1. Settlement of the crest, slopes, abutments and/or foundation of the dam/dike that may eventually result in breaching of the dam/dike.
2. Significant increase in length, width, or offset of cracks in the crest, slopes abutments, and/or foundation of the dam/dike that may eventually result in breaching of the dam/dike.

Emergency Level 3: Urgent; dam/dike failure appears imminent or is in progress

1. Sudden or rapidly proceeding slides, settlement, or cracking of the embankment crest, slopes, abutments, and/or foundation, and breaching of the dam/dike appears imminent or is in progress.

5.2 Step 2: Notification and Communication

5.2.1 Notification

After the emergency level has been determined, the people on the notification charts (see *Section 2* for the appropriate emergency level) shall be notified immediately.

Contact information for additional emergency services contacts are listed in *Section 5.2.3*.

5.2.2 Communication

Emergency Level 1: Nonemergency, unusual event, slowly developing

The dam/dike operator's representative should contact the dam operator's technical representatives and state dam safety officials. Describe the situation, and request technical assistance as needed. Where the concern is heavy precipitation or rising water levels which are likely to necessitate water releases, the NRLHA will contact the Norwood Emergency Management Coordinator and the two key downstream property owners as detailed in the Water Management Procedure in Appendix J.

Emergency Level 2: Emergency event, potential dam/dike failure situation; rapidly developing

The following message may be used to help describe the emergency situation to the incident commander or local emergency management personnel:

"This is _____ (Identify yourself; name, position) _____.

We have an emergency condition at Willett Pond Dam and Dike, located 2.5 miles southwest of Norwood Center.

We have activated the Emergency Action Plan for this dam and are currently under Emergency Level 2.

We are implementing predetermined actions to respond to a rapidly developing situation that could result in dam and/or dike failure.

Please prepare to evacuate low-lying areas along Hawes Brook and the Neponset River in Norwood, Massachusetts.

Reference the evacuation map in your copy of the Emergency Action Plan.

We will advise you when the situation is resolved or if the situation gets worse.

I can be contacted at the following number _____. If you cannot reach me, please call the following alternative number _____."

Emergency Level 3: Urgent event; dam/dike failure appears imminent or is in progress



The incident commander should be contacted immediately and the area evacuated (see *Figures 6 through 13* and *Appendix A*). The following actions should be taken:

1. Call the incident commander's number or 911. Be sure to say, "This is an emergency." They will call other authorities and the media and begin the evacuation. The following message may be used to help describe the emergency situation to the incident commander or local emergency management personnel:

"This is an emergency. This is _____ (Identify yourself: name, position) _____.

Willett Pond Dam and Dike, located 2.5 southwest of Norwood Center, is failing. The downstream area must be evacuated immediately. Repeat, Willett Pond Dam and Dike are failing; evacuate the area along low-lying portions of Hawes Brook and the Neponset River in Norwood, Massachusetts.

We have activated the Emergency Action Plan for this dam and dike and are currently under Emergency Level 3. Reference the evacuation map in your copy of the Emergency Action Plan.

I can be contacted at the following number _____. If you cannot reach me, please call the following alternative number _____."

2. Do whatever is necessary to bring people in immediate danger (anyone on the dam, downstream from the dam, boating on the impoundment, or evacuees) to safety if directed by the incident commander.
3. Keep in frequent contact with the incident commander and emergency services to keep them up-to-date on the condition of the dam. They will tell you how you can help handle the emergency.
4. If all means of communication are lost: (1) try to find out why, (2) try to get to another radio or telephone that works, or (3) get someone else to try to re-establish communications. If these means fail, handle the immediate problems as well as you can, and periodically try to re-establish contact with the incident commander and emergency services.

The following pre-scripted message may be used as a guide for the incident commander or local emergency services personnel to communicate the status of the emergency with the public:

Attention: This is an emergency message from the _____. Listen carefully. Your life may depend on immediate action.

Willett Pond Dam and Dike, located 2.5 southwest of Norwood Center, are failing. Repeat, Willett Pond Dam and Dike are failing.

If you are in or near this area, proceed immediately to high ground well away from low-lying areas along Hawes Brook and the Neponset River. Affected areas include portions of Norwood and Walpole.

*Do not return to your home to recover your possessions. You cannot outrun or drive away from the flood wave.
Proceed immediately to high ground away from Hawes Brook and the Neponset River.*

Repeat message.

5.2.3 Emergency Services Contracts

In addition to the contacts included on the Notification Flowchart in Section 2, the following list may be useful in the event of a dam emergency.

Agency / Organization	Principal Contact	Address	Office Telephone Number	Alternate Telephone Numbers
DAM/DIKE OWNER				
<u>Dam/Dike Owner/Operator:</u> NRLHA	General Office Ian Cooke Tom Palmer	2173 Washington Street Canton, MA 02021	(O): 781-575-0354	(C): 978-467-5271 [REDACTED]
<u>Dam Abutters</u> Adjacent to spillway	Dan and Anne Maneikis	[REDACTED]	[REDACTED]	[REDACTED]
<u>Technical Representative</u> Fuss & O'Neill	Phil Moreschi	146 Hartford Road Manchester CT, 06040	(O): 860-646-2469 x5223	860-690-0434
TOWN OF NORWOOD				
<u>Incident Commander:</u> Emergency Planning Coordinator/Assistant Town Manager	Bernard Cooper	Town Hall, 566 Washington Street Norwood, MA, 02062	(O): 781-762-1240	[REDACTED]
<u>Emergency Management Services:</u> Norwood Police Department	William G. Brooks General Office	137 Nahatan St., Norwood, MA, 02062	(O): 781-762-1212	911
<u>Emergency Management Services:</u> Norwood Fire Department	Anthony J. Greeley	137 Nahatan St., Norwood, MA, 02062	(O): 781-762-1313	911
<u>Town of Norwood Engineering Services:</u> Norwood DPW Director and Engineer	Mark Ryan	1 Lyman Place, Norwood, MA, 02062	(O): 781-762-1413	[REDACTED]
<u>Town of Norwood:</u> Norwood General Manager	John Carroll	Town Hall, 566 Washington St. Norwood, MA, 02062	(O): 781-762-1240 x101	[REDACTED]
TOWN OF WALPOLE				
<u>Incident Commander:</u> Emergency Management Director	Roger Turner	972 Main St., Walpole, MA, 02081	(O): 508-660-7365	[REDACTED]
<u>Emergency Management Services:</u> Walpole Police Department	Richard B. Stillman General Office	972 Main St., Walpole, MA , 02081	(O): 508-668-1095 (O): 508-668-1212	

Agency / Organization	Principal Contact	Address	Office Telephone Number	Alternate Telephone Numbers
<u>Emergency Management Services:</u> Walpole Fire Department	Timothy F. Bailey Jr.	20 Stone St., Walpole, MA, 02081	(O): 508-668-0260	911
<u>Town of Walpole Engineering Services:</u> Walpole DPW Director	Robert O'Brian	135 School St., Walpole MA, 02081	(O): 508-660-7305	
<u>Town of Walpole Engineering Services:</u> Walpole Engineer	Maggie Walker	135 School St., Walpole MA, 02081	(O): 508-660-7211	
<u>Town of Walpole:</u> Walpole Town Administrator	James Johnson	135 School St., Walpole MA, 02081	(O): 508-660-7289	
AT RISK DOWNSTREAM DAM OWNERS				
<u>Norwood Ellis Pond Dam Incident Commander:</u> Emergency Planning Coordinator/Assistant Town Manager	Bernard Cooper	Town Hall, 566 Washington Street Norwood, MA, 02062	(O): 781-762-1240	
STATE				
State Dam Safety Agency: Director of Massachusetts DCR Office of Dam Safety	William Salomaa	180 Beaman Street West Boylston, MA 01583	(O): 508-792-7716 x600	
Massachusetts Emergency Management Agency (MEMA) Region 2 Office Manager	James Manion	12-I Rear, Administration Road Bridgewater, MA 02324-0054	(O): 508-427-0401	(24/7): 508-820-2000 (O): 508-427-0400
Massachusetts Department of Transportation (MassDOT) Main Office		10 Park Plaza, Suite 4160 Boston, MA 02116	(O): 857-368-4636	911
Massachusetts State Police Foxboro, Station H-3			(O): 508-543-8550	911
Massachusetts State Police State Headquarters		470 Worcester Road Framingham, MA 01702	(O): 508-820-2300	911
Massachusetts Bay Transit Authority Commuter Rail Police	Chief Train Dispatcher General Office		(O): 617-222-8106 (O): 617-222-8101	911
OTHER				
<u>Willett Pond Charitable and Protection Association</u> Willett Pond Operating Committee	Leo Cesareo	25 Woodruff Road, Walpole, MA 02081		
Low Lying Area along Hawes Brook Colantuoni Bros. Construction	Paul Colantuoni	77 Davis Ave., Norwood, MA, 02062		
<u>Low-lying Area Along Hawes Brook</u> Norwood Commerce Center	Rich Bruno			

Agency / Organization	Principal Contact	Address	Office Telephone Number	Alternate Telephone Numbers
<u>U.S. Army Corps of Engineers</u> New England District (USACE)	David Schafer Emergency Operations	696 Virginia Road Concord, MA 01742	(O): 978-318-8274	(C): 978-318-8271
<u>National Weather Service Forecast Center</u> (Emergency Only)	Nicole Belk		(O): 508-823-2242	(C): 508-823-2228
<u>National Weather Service River Forecast Center</u>	Robert Shedd	445 Myles Standish Blvd., Taunton, MA, 02780		

All home and mobile telephone numbers listed are confidential and are not for public/general distribution.

(O) = Office; (C) = Cellular phone; (H) = Home phone

Bold indicates primary contact

5.3 Step 3: Emergency Actions

If the police receive a 911 call regarding observations of an unusual or emergency event at the dam/dike, they should immediately contact the dam/dike owner (NRLHA staff). After the dam/dike owner determines the emergency level, the following actions should be taken. If time permits, the dam/dike owner's technical representatives and state dam safety officials should be contacted for technical consultation.

5.3.1 Emergency Level 1: Unusual Condition – Nonemergency, Unusual Event, Slowly Developing

- A. NRLHA staff (dam/dike owner) should inspect the dam and/or dike where the unusual condition was reported. At a minimum, inspect the spillway and the full length of the upstream slope, crest, downstream toe, and downstream slope of the dam and/or the dike. Also, check the impoundment area, abutments, and downstream channel for signs of changing conditions. **If increased seepage, erosion, cracking, or settlement are observed, immediately report the observed conditions to the dam/dike owner's technical representatives or state dam safety officials; refer to the emergency level table for guidance in determining the appropriate event level for the new condition and recommended actions.**
- B. Record all contacts that were made on the *Contact Checklist* (*Appendix H*). Record all information, observations, and actions taken on the *Event Log Form* (*Appendix H*). Note the time of changing conditions. Document the situation with photographs and video, if possible.
- C. The dam/dike owner should contact the dam/dike owner's technical representatives and request technical staff to investigate the situation and recommend corrective actions.

5.3.2 Emergency Level 2: Early Warning – Potential Dam/Dike Failure Situation, Rapidly Developing

- A. NRLHA staff (dam/dike owner) should contact the dam/dike owner's technical representatives and state dam safety officials to report the situation and, if time permits, request technical staff to investigate the situation and recommend corrective actions.
- B. NRLHA staff (dam/dike owner) should contact the incident commanders (one each in Norwood and Walpole) to inform him/her that the EAP has been activated and if current conditions get worse, an emergency situation may require evacuation. Preparations should be made for possible road closures and evacuations.
- C. Provide updates to the incident commanders and emergency services personnel to assist them in making timely decisions concerning the need for warnings, road closures, and evacuations.
- D. If time permits, NRLHA staff (dam/dike owner) should inspect the dam and/or dike where the unusual condition was reported. At a minimum, inspect the full length of the upstream slope, crest, downstream toe, and downstream slope of the dam and/or dike. Also, check the reservoir area, abutments, and downstream channel for signs of changing conditions. **If soil piping, increased seepage, erosion, cracking, or settlement, are observed, immediately report the observed conditions to the dam/dike owner's technical representatives and state dam safety officials; refer to the emergency level table for guidance in determining the appropriate event level for the new condition and recommended actions.**
- E. Record all contacts that were made on the *Contact Checklist (Appendix H)*. Record all information, observations, and actions taken on the *Event Log Form (Appendix H)*. Note the time of changing conditions. Document the situation with photographs and video, if possible.
- F. If time permits, the following emergency remedial actions should be taken as appropriate.

5.3.2.1 Emergency Remedial Actions

If time permits, the following emergency remedial actions should be considered for Emergency Level 2 conditions. Immediate implementation of these remedial actions may delay, moderate, or prevent the failure of the dam and/or dike. Several of the listed adverse or unusual conditions may be apparent at the dam and/or dike at the same time, requiring implementation of several modes of remedial actions. Close monitoring of the dam/dike must be maintained to confirm the success of any remedial action taken at the dam/dike. Time permitting any remedial action should be developed through consultation with the dam owner's technical representatives and state dam safety officials. See *Appendix B* for sources of equipment and materials to assist with remedial actions.

Embankment overtopping

1. If not already implemented, remove flashboards and maximize discharge from low level outlet.
2. If the water level in the reservoir is no longer rising, place sandbags along the low areas of the top of the dike to control wave action, reduce the likelihood of flow concentration during minor overtopping, and to safely direct more water through the spillway.
3. Cover the weakest and/or lowest areas of the top of the dike and downstream slope with riprap, sandbags, plastic sheets, or other materials to provide erosion-resistant protection.
4. If the water level is continuing to rise and a Level 3 embankment overtopping condition is anticipated, select an area of the dike with a low structural height (generally the south or north end of the dike) to serve as an improvised emergency spillway. Armor the improvised spillway and downstream slope with rip rap or plastic sheeting (sheeting should be anchored underwater on the upstream side of dike and extend over the crest and down the back slope), and place sandbags along the top of the rest of the dike to direct overtopping flows through the improvised emergency spillway.
5. Under extreme circumstances, there may not be enough time to lay sandbags before overtopping is expected. In such circumstances, it may be desirable to excavate an improvised emergency spillway in an area of the dike with low structural height in order to prevent an uncontrolled failure of the dike in an area of taller structural height. Ideally this would be a shallow (i.e. 1') excavation across a relatively large distance (100'+) to an elevation just above the water elevation, and the excavated area and downstream slope should be protected with plastic sheeting or similar material before water begins to flow through the improvised spillway.

Seepage and sinkholes

1. Open the dam outlet controls to lower the reservoir level as rapidly as possible to a level that stops or decreases the seepage to a non-erosive velocity. If the outlet controls are damaged or blocked, pumping or siphoning may be required.

Continue lowering the water level until the seepage stops.

2. If the entrance to the seepage origination point is observed in the reservoir (possible whirlpool) and is accessible, attempt to reduce the flow by plugging the entrance with readily available materials such as hay bales, bentonite, soil or rock fill, or plastic sheeting.
3. Cover the seepage exit area(s) with several feet of sand/gravel to hold fine-grained embankment or foundation materials in place. Alternatively, construct sandbag or other types of ring dikes around seepage exit areas to retain a pool of water, providing backpressure and reducing the erosive nature of the seepage.

4. Prevent personnel from walking and vehicles and equipment from driving between the seepage exit points and the embankment to avoid potential loss from the collapse of an underground void.

Embankment movement

1. Open outlet(s) and lower the reservoir to a safe level at a rate commensurate with the urgency and severity of the condition of the slide or slump. If the gate is damaged or blocked, pumping or siphoning may be required.
2. Repair settlement of the crest by placing sandbags or earth and rock fill materials in the damaged area to restore freeboard.
3. Stabilize slides or leaning walls by placing a soil or rock fill buttress against the toe of the slide or face of the wall.

Earthquake

1. Immediately conduct a general overall visual inspection of the dam and dike.
2. Perform a field survey to determine if there has been any settlement and movement of the dam/dike embankment, spillway, and low-level outlet works.
3. Drain the reservoir, if required.

5.3.3 Emergency Level 3: Final Warning – Urgent; Dam Failure Appears Imminent or is in Process

- A. The dam/dike operator's representative shall immediately contact the incident commander and others shown on the notification chart.
- B. The incident commanders shall lead the efforts to carry out warnings, close roads, and evacuate people at risk downstream from the dam/dike (Inundation Maps are included as *Figures 6 through 13* and downstream resident contact list is included as *Appendix A*).
- C. Emergency management services personnel shall alert the public and immediately evacuate at-risk people and close roads as necessary.
- D. NRLHA staff (dam/dike owner) shall maintain continuous communication and provide the incident commander with updates of the situation to assist him/her in making timely decisions concerning warnings and evacuations.
- E. NRLHA staff (dam/dike owner) should record all contacts that were made on the *Contact Checklist (Appendix H)*. Record all information, observations, and actions taken on the *Event Log Form*



(*Appendix H*). Note the time of changing conditions. Document the situation with photographs and video, if possible.

- F. Advise people monitoring the dam/dike to follow safe procedures. Everyone should stay away from any of the failing structures or slopes and out of the potential breach inundation areas.

5.4 Step 4: Termination and Follow-Up

When the EAP has been activated, an emergency level has been declared, all EAP actions have been completed, and the emergency is over, the EAP operations must eventually be terminated and follow-up procedures completed.

The incident commanders are responsible for terminating EAP operations and relaying this decision to the NRLHA staff (dam/dike owner). It is then the responsibility of each person to notify the same group of contacts that were notified during the original event notification process to inform those people that the event has been terminated.

Prior to termination of an Emergency Level 3 event that has not caused actual dam/dike failure, the dam/dike owner's technical representatives or state dam safety officials will inspect the dam/dike or require the inspection of the dam/dike to determine whether any damage has occurred that could potentially result in loss of life, injury, or property damage. If it is determined that conditions do not pose a threat to people or property, the incident commanders will be advised to terminate EAP operations as described above.

NRLHA staff (dam/dike owner) shall assure that the *Dam Emergency Situation Report* (*Appendix H*) is completed to document the emergency event and all actions that were taken. NRLHA staff (dam/dike owner) shall distribute copies of the completed report to state dam safety officials and the dam owner's technical representatives.

6 General Responsibilities

Roles and responsibilities under the EAP are summarized in *Section 1*. Additional information is included in the following sections.

Although an unlikely event, the sudden release of water due to breaching of Willett Pond Dam and Dike may cause significant and very rapid flooding along Hawes Brook, and portions of the Neponset River, shown on the Inundation Maps in *Figures 6 through 13*. A number of roadways will be inundated by the flood wave, rendering them impassable. Emergency respondents need to be made aware of this potential in coordinating their responses and evacuations.

Dam/dike break scenarios would undoubtedly tax emergency services and resources at the local government level. Accordingly, this EAP has been developed to describe the general procedures to be

followed and identify the duties and responsibilities of key emergency personnel in the event of such an occurrence.

A general description of duties and responsibilities is provided in this EAP for emergency response entities such as the local Fire Department, Police Department, and State Emergency Management. These descriptions are provided to show how other entities may be integrated into the overall notification chain of command and how they would lend their assistance and expertise before, during, and after an emergency situation at Greenville Pond Dam. The procedures highlighted in the EAP are not intended to usurp the responsibility of governmental entities for warning, evacuation, and recovery.

6.1 Dam Owner Responsibilities

As primary owner, NRLHA staff is responsible for detecting and evaluating dam/dike safety incidents, classifying the incident, notifying emergency management authorities, and taking appropriate response actions. NRLHA staff must also ensure that emergency management authorities are provided with timely and accurate information on dam/dike conditions during an incident. This information will help agencies make the appropriate decisions on evacuations.

NRLHA staff is also responsible for ongoing maintenance of the dam and dike and for supplying equipment, materials, and labor in the event of a dam/dike emergency.

The specific responsibilities of the dam owner under this EAP are outlined below. Roles and responsibilities under the EAP are also summarized in *Section 1*.

Preparedness

- Review and update EAP, as necessary, including notification procedures, alert lists, and inspection/surveillance checklists. The review and update should be made on an annual basis or more frequently.
- Train NRLHA staff in proper procedures for surveillance and emergency repair.
- Conduct a yearly in-house EAP drill to test the validity of notification procedures and communication systems.
- Perform periodic inspections of the condition of each of the appurtenant structures at Willett Pond Dam and Dike, maintain the structural integrity of the dam and dike, and make routine maintenance repairs as necessary.
- Monitor the pond level and condition of the dam/dike during high flow storm events.

Increased Readiness

- Review and update resource information.
- Inspect equipment (e.g., fuel, backhoes and dump trucks, radios).
- Prepare to mobilize available on-site resources.

Level 2 Emergency (Early Warning) Notification

- Notify the Engineer of Record and the MADCR Office of Dam Safety of the emergency situation and consult for repair guidance.
- Initiate Notification Flowchart Procedures by calling both the Town of Norwood's and the Town of Walpole's Emergency Management Coordinators. The Emergency Management Coordinator will call their respective town's Police Departments, Downstream Residents, and the MEMA regional office.
- Establish an On-Site Emergency Operation Center.
- Mobilize staff and equipment to the affected area to institute emergency repair procedures (if time and safety considerations permit).
- Coordinate with area contractors to mobilize resources for emergency repair, as necessary.

Level 3 Emergency (Final Warning) Notification

- Order evacuation of emergency personnel from repair area (if repairs are underway).
- Contact the Town Emergency Management Coordinators, who will initiate Notification Flowchart Procedures by calling 911 or the dispatch number.
- The Emergency Management Coordinators will also initiate notification of downstream residents and MEMA's regional office.
- Notify MBTA transit police.
- Notify Fuss & O'Neill of the emergency situation.
- Notify the MADCR Office of Dam Safety.
- Provide periodic updates to the Town Emergency Management Coordinators as to condition of affected embankment, pool level, and estimated discharge through the breach.

Recovery

- Perform detailed damage assessment of affected dam/dike embankment and appurtenant structures.
- Perform detailed damage assessment of site facilities downstream of the dam/dike location.
- Thoroughly document emergency response activities and develop post-disaster reports/debriefing on overall emergency operations by the Town Emergency Management Coordinators.
- Modify/update the EAP as necessary.

6.2 Notification and Communication Responsibilities

After the emergency level at the dam has been determined, notifications are made in accordance with the Notification Flowchart (see *Section 2*).

Once notified of an incident at the dam and/or dike, local emergency management authorities may activate an Emergency Operations Center (EOC) to serve as a central coordination center for emergency response, warning, and evacuation activities. A representative of the dam owner (NRLHA staff) should go to the EOC to help agency personnel understand the project-specific information and inundation maps.

Interaction with the media should be implemented through the local or State emergency management authority. These agencies should have a Public Information Officer (PIO) and/or a Joint Information Center for disseminating information and handling inquiries. It is highly recommended that the dam/dike owner and the appropriate incident or emergency management authority work in partnership to accomplish this task.

Proper coordination and communication among onsite technical personnel at the dam/dike, PIOs, and emergency personnel at the EOC are of critical importance to the successful implementation of the EAP. These activities should be thoroughly tested during comprehensive EAP exercises and modified as necessary.

6.3 Evacuation Responsibilities

Warning and evacuation planning and implementation are responsibilities of local emergency management authorities with the legal authority to perform these actions. Under the EAP, the dam/dike owner is responsible for notifying the appropriate emergency management authority when an incident is anticipated, is imminent, or has occurred. Detailed warning and evacuation protocols are key elements in an EAP exercise, but are not included in the EAP itself. Inundation maps included as *Figures 6 through 13*, as well as lists of downstream residents and businesses included as *Appendix A*, will help in the development of detailed warning and evacuation plans.



During a failure emergency, the Norwood and Walpole Police Departments will provide traffic control and direct evacuees along the major evacuation routes toward upland areas and away from the inundation areas shown on the Inundation Maps (*Figures 6 through 13*). In addition to traffic control, local police/fire department personnel will provide a warning of the emergency to residents.

The Towns have Reverse 911 systems available, and a list of phone numbers is also included as *Appendix A*. The Town has agreed to set up a reverse 911, and if any of the listed downstream properties change contact information, these changes will be updated by the Towns in the reverse 911 process. If residents either do not have phone numbers or have unlisted numbers, and in order to assist those with special needs, police/fire department personnel will likely also use a warning siren (where available), loudspeakers, and door to door notification. The evacuation procedures to be implemented should be developed in detail prior to an emergency situation. Some generalized procedures are discussed below.

6.3.1 Traffic Control Management – Communication

The emergency-situation reporting system should include local police, fire, and emergency support personnel at the evacuation site reporting evacuation progress (traffic flow rate, percent evacuated, etc.) at frequent, pre-designated intervals to their respective headquarters. The police, fire, and/or emergency headquarters will relay the information to the incident commanders, or his/her designee, and make recommendations for critical needs to improve the progress. The incident commanders, or his/her designee, will report the evacuation progress and any requests for critical needs to MEMA for support.

6.3.2 Generalized Traffic Control Pattern

According to the dam-break analysis, the inundation areas occur along Hawes Brook, and portions of the Neponset River. Based on the generally west to east flood flow direction within the flood zone, the general evacuation direction should be toward the north and to the south, away from low-lying areas downstream of the dam/dike.

6.3.3 Use of Specific Streets During Evacuation

Traffic over the roads listed in *Section 4.5* within the inundation area should be redirected away from the flood zone. The decision to allow traffic over the bridges/culverts after an emergency has been declared should be based upon field observation of the water height and the amount of debris obstructions flowing at the bridges/culverts, as well as the structural condition of the bridges/culverts and roadways.

6.4 Monitoring Security Termination and Follow-Up Responsibilities

NRLHA staff (primary dam/dike owner) will be in charge of on-site monitoring of the situation and keeping local authorities informed of any developments of the emergency situation from the time of emergency declaration until it has been terminated. The dam/dike owner shall also be responsible for security at the site. Brook Street provides access from the north to the left abutment, and the left up and downstream slopes while Bullard Street provides access (from the south) to the dam's right abutment and access to the dike's crest via an easement. If a security problem develops, the dam/dike owner will be responsible for responding to it with appropriate action.

When the emergency condition has been abated, and there is no longer a threat to life or property, the dam/dike owner will be responsible for declaring that the emergency at the dam and/or dike is terminated. The local emergency management officials are responsible for termination of the disaster response activities.

In the event that this EAP shall be invoked, it is imperative that the parties involved share and evaluate their experiences and also prepare a written report documenting same. The dam/dike owner will be responsible for providing this follow-up.

6.5 EAP Coordinator Responsibilities

NRLHA will be responsible for overall EAP-related activities, including but not limited to preparing revisions to the EAP, establishing training seminars, coordinating EAP exercises, and serving as the contact for questions about the plan.

Revisions to this Emergency Action Plan shall be the ultimate responsibility of the dam/dike owner, as specified by 302 CMR 10.11. The EAP shall be reviewed and updated annually. Any questions regarding the EAP should be brought to the NRLHA.

7 Preparedness

Preparedness actions are taken to prevent a dam and/or dike failure incident or to help reduce the effects of a dam/dike failure or operational spillway release and to facilitate response to emergencies. A few of the preparedness actions that a dam/dike owner may take include providing emergency flood operating instructions and arranging for equipment, labor, and materials for use in emergency situations.

7.1 Surveillance and Monitoring

Surveillance should be conducted as outlined in *Section 5* of this document. Early identification of the existence or potential for occurrence of emergency conditions is essential for initiating emergency repairs and for issuing appropriate notification to potentially affected parties in a timely manner. NRLHA staff should conduct detailed inspections of the Dam and Dike and surrounding appurtenances



at a minimum of once every three months or whenever any unusual conditions are reported. If conditions safely allow it, these observations should include a walk along the crest and toe of the structure to check for seepage, boils, and/or other signs of leakage or other unusual occurrences at the dam/dike.

In addition, the NRLHA's engineering consultant performs a formal dam safety inspection at least every 2 years in accordance with the Department of Conservation and Recreation Office of Dam Safety procedures.

At times of high pond levels (i.e., within 2 feet of dike crest), the frequency of inspection should be increased as detailed in *Section 5*. Other cases requiring more frequent inspection include:

- A Registered Professional Engineer should undertake an immediate and thorough inspection of the dam/dike following a seismic event, other disturbance, or unusual movement.
- Increases in the amount of seepage, formation of new seeps or boils, or turbid (muddy) discharge.

Early detection of emergency conditions is primarily by non-routine visual observation by NRLHA personnel. Such visual observations would be of visible deterioration, blocked or damaged spillway, accidental boat impact, vandalism, or sabotage. A number of homes abut the Dike and a public roadway traverses the Dam. As a result, informal surveillance is conducted by numerous abutters and the public on a daily or even hourly basis. Immediate abutters have been furnished with NRLHA 24 hour contact information. The Norwood and/or Walpole Police Departments field reports from members of the general public.

Flooding is the most likely cause of an emergency condition, and therefore NRLHA staff monitor weather forecasts on a daily basis. When the National Weather Service (the "NWS") issues a Flood Watch or Flood Warning for the area, NRLHA staff begin closely monitoring NWS quantitative precipitation forecasts, real-time precipitation data and weather radar, at least once every four hours (see Appendix A for a list of weather monitoring resources). Once the NWS forecasts precipitation accumulations of 5 or more inches over 24 hours, the spillway is inspected at least once every 8 hours to check and record water levels and confirm that the spillway is clear. NRLHA staff should also stay informed of rainfall or upstream release events that could cause an emergency condition at the dam/dike. Weather forecast information, including flood watches and warnings, can be obtained on the NOAA National Weather Service website at <http://www.nws.noaa.gov/>

All inspections should be performed with proper safety equipment. Means of remote communication (e.g., cellular phone or two way radio) should be maintained to allow prompt contact with emergency officials if unsafe conditions are found at the dam/dike. Additionally, arrangements for mobile high intensity lighting systems should be made to allow observations during darkness. Such systems may be available from the local police, fire department, or state police. If a failure of the dam/dike appears imminent, care should be taken during the inspection to remain at a safe distance from the structure.

Recommended inspection equipment includes the following:

- Portable radio or cell phone
- Watch
- Log book
- Inspection forms or checklists
- Weather gear
- Flashlights
- Record Log
- Life Jackets
- Probing rod
- Short wooden stakes
- 40 feet of half-inch nylon safety line to connect team members, if necessary
- Camera

7.2 Evaluation of Detection and Response Timing

Total EAP implementation time from the initiation of an actual incident to determination of an emergency situation and notification of appropriate entities involved with implementation should be evaluated and understood. The impact of the timing should be considered when developing preparedness actions. Timely implementation of the EAP and coordination and communication with emergency management authorities are crucial elements in the effectiveness of the emergency response effort.

7.3 Access to the Site

Both the dam and dike can be easily accessed from Brook Street from the north or Bullard Street from the south. However, during a dam emergency this roadway may not be safe as this street runs along top of the dam (the crest) and its spillway. . The Saint Timothy's Church just north of the dam on Brook Street may be a more suitable location for staging of people and equipment. NRLHA has deeded access rights from Bullard Street in Walpole to the south end of the Dike via the driveway at 163 Bullard Street. Additional access points available by permission include at 197 Bullard Street via a dirt road with semi paved ramp near the center of the Dike or via the driveways of 305 or 315 Bullard Street which are near the north end of the Dike.

7.4 Response during Periods of Darkness

In addition to regular street lighting, the dam/dike will be illuminated using auto and truck lights, or police floodlights in emergencies. NRLHA must also include generators and flood lighting among its flood fighting equipment in case of an extended emergency at the dam/dike during nighttime hours.

7.5 Response during Weekends and Holidays

Emergency response should follow regular response procedures unless an individual in the line of response has set forth an alternate procedure for a certain time period. Actual response time will be a function of how and by whom the initial emergency condition is discovered and by weather conditions; however, the NRHLA must have a plan for staff availability outside of normal working hours.

7.6 Response during Adverse Weather

The Town Emergency Management Coordinators will likely be in a heightened state of readiness in the event of predicted or actual adverse weather conditions. There may be significant flooding for 100-year storms and larger downstream of the dam due to major storm events. It is expected that flooding might be catastrophic for a storm of the magnitude of the $\frac{1}{2}$ PMF, with or without a failure of the dam and/or dike. Accordingly, it is possible that evacuation procedures for the downstream area would be underway before a failure of the dam/dike occurred under extreme adverse weather.

A staff member from NRLHA should be at the site during all major storms to make observations of the reservoir level and condition of the dam/dike, and this representative should have an adequate means of communication to initiate the notification flow chart if needed.

7.7 Alternative Sources of Power

Generators should be identified and available through contractors, commercial sources, abutters or the local Departments of Public Works to be used for emergency lighting, , or other needs.

7.8 Emergency Supplies and Information

NRLHA is in charge of standard operations and maintenance of both the dam and dike and is most familiar with the dam procedures and location of available equipment. The NRLHA also keeps the following materials on hand to facilitate investigation of unusual conditions and the implementation of remediation measures, or can obtain them readily through one or more of the contractors/vendors listed in Appendix B. As a last resort, some of these resources may also be available through the Norwood or Walpole Departments of Public Works.

- 24/7 cellular phones
- Civilian 2-way radios
- Shovels
- Emergency lighting
- Generators
- Floation vests
- Pumps
- Sources of borrow material
- Watch

- Log book
- Inspection forms or checklists
- Weather gear
- Record Log
- Probing rod
- Short wooden stakes
- 40 feet of half-inch nylon safety line to connect team members, if necessary
- Camera
- Empty sandbags
- Sand
- Graded mix of large (9") rip rap
- 40 ml polyethylene geotextile
- Backhoe
- Excavator
- Chainsaw

This equipment should be used to buttress the existing dam structure (e.g., raise the crest of the dam or buttress eroded embankment areas) before water levels rise appreciably, or if possible, to perform emergency repairs during flooding. NRLHA staff will seek to resolve any condition that threatens the integrity of the dam and/or dike and will seek appropriate assistance and supplies where necessary.

7.9 Stockpiling Materials and Equipment

An inventory of available equipment, materials and manpower which could be utilized to clear debris blocking the spillway, repair erosion of the embankment, place sandbags, etc. is listed in *Appendix B*. This list should be maintained by NRLHA and revised as necessary.

7.10 Coordination of Information

In the event of an emergency situation, the Emergency Management Coordinators or designated Incident Commanders must establish an Emergency Operation Center (EOC) to serve as the main distribution center for warning and evacuation activities. The recommended location of the EOC is shown in *Figure 5*.

7.11 Coordination of Information

Training and testing of the various aspects of the EAP for the Willett Pond Dam and Dike described herein are necessary to improve operational readiness. In support of that goal, NRLHA will coordinate training, initial and subsequent EAP testing that will:

- Clarify/modify roles and responsibilities
- Improve government interagency cooperation, communication and coordination
- Improve individual performance

- Increase state/local emergency management relationships relating to a potential emergency at the dam.
- Reveal plan weaknesses
- Reveal resource gaps

Initial training should take the form of an **Orientation Seminar**. Subsequent training by **Tabletop Exercises** should be conducted.

The following sections provide a suggested outline of instructions and topics to be presented at the Orientation Seminar and Tabletop Exercises. The contents generally followed the criteria presented in the "Exercise Design Course - Guide to Emergency Management Exercise," developed by the Federal Emergency Management Agency (FEMA), Emergency Management Institute. The information below fulfills FEMA's objective of instituting an exercise development program that begins simply and adds increasing complexity. Orientation seminar and Tabletop Exercise are the first two of the five elements of an exercise program. **Drill, Functional** and **Full-scale Exercises** are the third, fourth and fifth elements which are more complex in scope and require significant commitment of personnel and resource by various government agencies to conduct. The shorter Orientation Seminar and Tabletop Exercise are designed to identify policy issues or problems that should be resolved prior to conducting a functional exercise. The development of the Drill, Functional and Full- Scale Exercises are beyond the scope of this EAP. However, after successfully completing the Orientation Seminar and Tabletop Exercise, the primary owner, NRLHA, should consider the development of these more complex elements of emergency management exercises.

7.11.1 Orientation Seminar

The focus on the Orientation Seminar is on training and familiarization with roles, procedures, responsibilities, and personalities associated with the implementation of the EAP. It is intended to be relatively informal and designed to foster a cooperative spirit and elicit constructive discussion by the participants as they examine the EAP and the NRLHA's emergency management policy, and then resolve potential problems. The general purpose is for seminar participants to evaluate plans and procedures and to resolve questions of coordination and assignment of responsibilities in a non-threatening format and under minimum stress.

At this initial stage, it is recommended that management/operations personnel from the following agencies participate in the Orientation Seminar:

- NRLHA
- Norwood and Walpole Emergency Management Coordinators
- Norwood and Walpole Town Managers
- Norwood and Walpole DPW Personnel
- Norwood and Walpole Police and Fire Chiefs
- Massachusetts State Police

We recommend that the Norwood and Walpole Emergency Management Coordinators be responsible for organizing and controlling the Seminar. It is the responsibility of the controller/moderator to initiate a sequential "talk-through" discussion of participant roles and to conduct "brainstorming" sessions. Each attendee should be encouraged to actively participate in the discussion (possible in a "round table" format).

The key issues for discussion included, but are not necessarily limited to, the following:

- Familiarization with the overall framework and specific details of the Notification Flowcharts.
- Familiarization with alternate means of communication.
- Highlight differences between Emergency Level 2 (Early Warning) and Emergency Level 3 (Final Warning) and notification procedures for each situation.
- Identification and differentiation of problem conditions at the dam/dike observed during routine surveillance and maintenance.
- Review duties of other key emergency agencies and develop understanding of how the EAP is to "dovetail" into the existing preparedness plans for the downstream municipalities.

7.11.2 Tabletop Exercise

It is intended that the dam/dike owner conduct a Tabletop Exercise with key Norwood and Walpole representatives. The exercise is an activity in which key local emergency/operations officials are presented with simulated emergency situations with minimal or no time constraints for the participants to respond. It is to be conducted in an informal manner so as to elicit constructive discussion by the participants as they attempt to examine and then resolve any problems. The purpose is to evaluate the EAP procedures and to resolve questions of coordination and assignment of responsibilities in a non-threatening format with minimum stress. In addition, the objectives of the Tabletop Exercise are to:

- Evaluate the validity of the EAP
- Foster cooperation and familiarity amongst the various agencies
- Practice problem solving as a group
- Familiarize new staff with EAP (during annual review of plan)
- Familiarize agencies with their roles
- Test individual/group message interpretation

It is recommended that key personnel from the following agencies participate in the Tabletop Exercise.

- NRLHA
- Norwood and Walpole Emergency Management Coordinators
- Norwood and Walpole DPW Personnel



- Norwood and Walpole Police and Fire Chiefs
- Massachusetts State Police

It is recommended that the exercise be held at a facility where communications equipment, various plans, displays and Inundation Maps will normally be available on the premises. However, any conference facility that will comfortably accommodate the number of participants in a face-to-face setting will be adequate.

Initiating the Exercise

The Tabletop Exercise will begin with a briefing period to orient the participants and simulators. Included in this introduction, will be summary of objectives, discussions, and clarification of ground rules and methods of message routing and simulation of various communications (i.e. telephone, microwave, and teletype). Any other special information on simulation procedures that may affect participant and simulator actions during the session should be discussed.

Finally, training staff will give an intelligence briefing to the group. The briefing consists of presenting the scenario narrative. The scenario narrative sets the scene for the simulated event and briefly describes what has happened up to the time of the exercise.

The narrative is intended to get the participants in the mood for the exercise. A scenario narrative should be created for this Exercise and subsequent annual training sessions.

Methods

The Tabletop session seeks to solve problems in a group. For problem resolution, the scene is set by scenario materials that include:

- Scenario Narrative- Sets the scene for the simulated event and briefly describes what has transpired up to the trail of the exercise.
- Major Sequence of Events - Itemizes the events from the beginning of the exercise to the conclusion that will result in emergency service actions in response to those events.
- Detailed Sequence of Events - List of details for each major event; intended to prompt messages or problems that in turn are to motivate action of the participants.
- Problems and Messages -Actual simulated transmissions that are given to participants.

The simulation materials should provide enough details about a hypothetical emergency condition at the dam, to allow the participants to apply their knowledge of local/state resources to the developing scenario and discuss problems that are verbally presented one at a time by the seminar leader. In Tabletop Exercises, the action revolves around delivery of pre-scripted problems or messages to the participants. All participants evaluate the same problem/message and announce their actions or

decisions at the conclusion of a "round." Discussion might then take place or the seminar leader could give another problem/message.

The exercise leader will introduce problems one at a time verbally or (for more advanced Tabletops) in the form of a written message. Participants will discuss the issues raised by the problem, using the EAP and other pertinent, existing in-place state/local preparedness plans for guidance and direction. The controller will monitor the participant discussion and assist in guiding the discussion if any action is necessary. Each problem/message will have a recommended time- frame for participant action. At the completion of participant action on a given problem, the controller will input another problem in the sequence of the hypothetical emergency condition. The participants should only work on one problem at a time. The controller will maintain a Problem Log and make appropriate notations concerning the participant actions, adequacy of the EAP to provide participants with guidance and direction, and any other problems that may arise during the exercise.

It is again emphasized that the Tabletop is basically a training exercise. It is intended to be low- key, low-stress with emphasis on training, not testing. The Tabletop Exercise is best suited to exercise single emergency management functions or a very few functions, such as notification, repair, traffic control, and identifying evacuation zones. Training in decision-making and resource mobilization/allocation are good uses for the Tabletop.

For more detailed information, refer to FEMA's "Exercise Design Course" manual.

7.12 Alternative Systems of Communication

The dam operator, Incident Commanders, and emergency response personnel should carry radios for use in the event of a cell phone outage, and the EOC should be supplied with radio equipment for communication with emergency personnel. Alternate methods of communication will include use of cellular phones. The initial contact between the dam and the dam/dike owner will likely be via telephone.

7.13 Public Awareness and Communication

The notification flowcharts and procedures in this EAP indicate who should notify downstream residents and the media and under what circumstances. Interaction with the media should be implemented through local or state emergency management authorities, who should have a Public Information Officer and/or a Joint Information Center for disseminating information and handling inquiries. Well in advance of an actual emergency, local emergency management personnel must prepare plans for increasing awareness of a potential dam/dike emergency, notifying the public of an actual emergency, and providing information of the actions people should take during an emergency.

8 Inundation Maps

Dam/dike breach inundation maps are included as *Figures 6 through 13*. The purpose of an inundation map is to show the areas that would be flooded and travel times for wave front and flood peaks at critical locations if a dam and/or dike failure occurs.

The addresses of homes and businesses that could be inundated in the event of a dam and/or dike breach, are listed in *Appendix A*. Information about the depth and timing of potential flooding at downstream road crossings and dams is indicated on the inundation maps. The contact list should be updated at least annually.

Inundation maps are to be used both by the dam/dike owner and emergency management authorities to facilitate timely notification and evacuation of areas potentially affected by a dam and/or dike failure or flood condition.

The inundation maps in this plan are based on a dam/dike failure analysis performed by Fuss & O'Neill for both storm event and fair weather failure scenarios. This analyses are described in *Appendix C*.

Two categories of dam/dike break analysis results are presented in this EAP. One is for wet weather conditions during a $\frac{1}{2}$ PMF (Probable Maximum Flood) event, taking into consideration both a dam and a dike breach. The other is for an unexpected dam/dike breach during dry ("sunny day") conditions. The wet weather failure will result in greater inundation downstream; however, dry weather failure may present a greater potential for loss of life due to the element of surprise even though less inundation would be realized. Routine inspection of the dam, dike and reservoir is critical to the identification of conditions that may lead to dry weather failure.

It is important to note that significant flooding would occur during the $\frac{1}{2}$ PMF event whether or not the dam/dike fails. Dam/dike failure would result in a flood wave, carrying debris from the failed dam in addition to the flooding that is already occurring due to the storm event. Accordingly, regular monitoring of the reservoir level and the condition of the dam and downstream channel during high flow storm events should be conducted.

9 References

The following references were utilized during the preparation of this report or were referenced in previous reports:

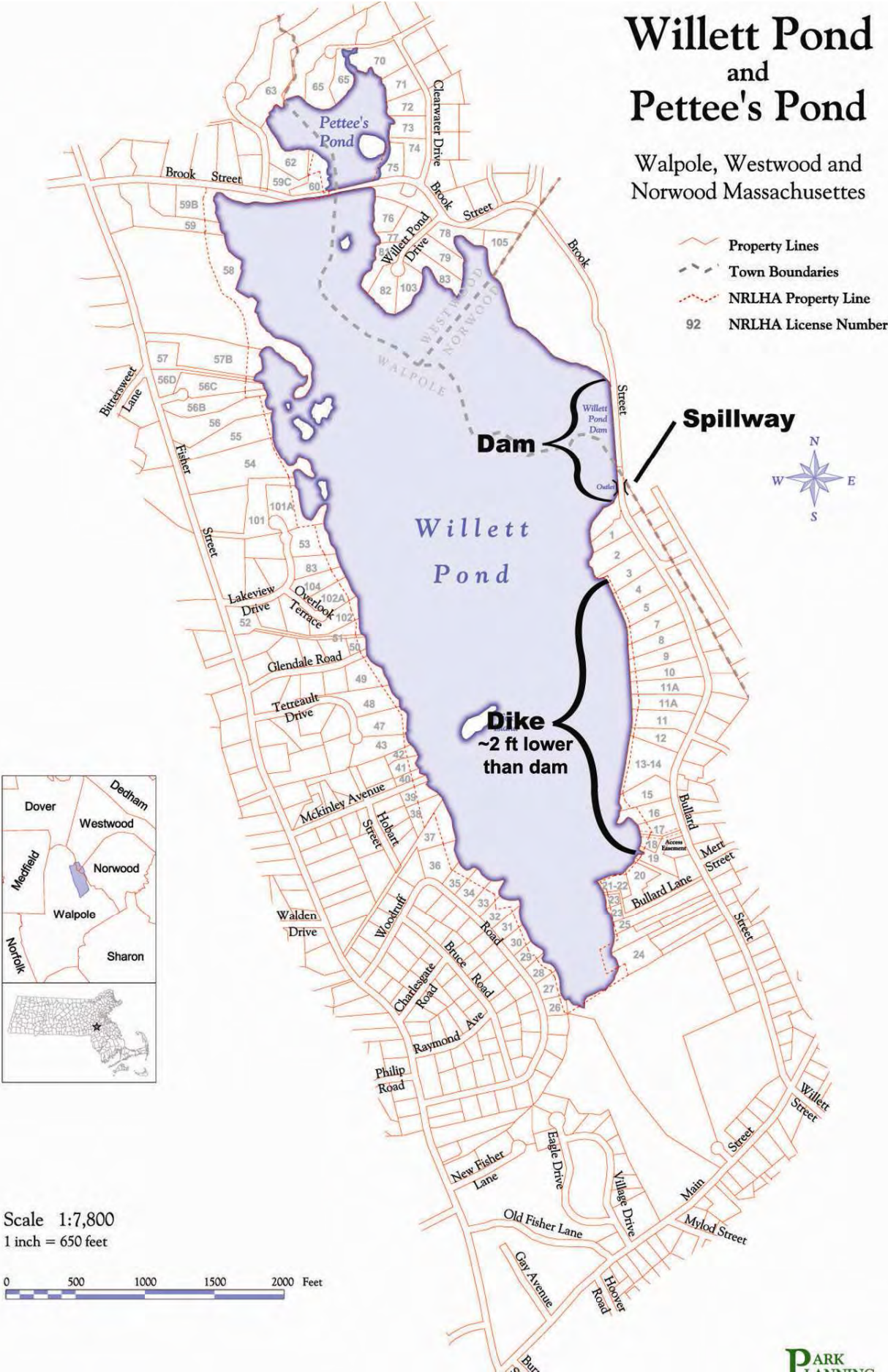
1. "Federal Guidelines for Dam Safety: Emergency Action Planning for Dams" (FEMA 64), Federal Emergency Management Agency, July 2013.
2. "Willet Pond Dam Phase I Inspection / Evaluation Report," Fuss & O'Neill, Inc., Inspection Date June 11, 2009.
3. "Emergency Action Plan for Willett Pond Dam and Dike," Neponset River Land Holding Association (NRLHA), July 2012.
4. "EAP Fillable Form," Natural Resources Conservation Service, June 2007.

Figures



Willetts Pond and Pettee's Pond

Walpole, Westwood and Norwood Massachusetts





MAP REFERENCE:
2005 ORTHOPHOTOS DOWNLOADED FROM MASSGIS
LAT/LONG COORDS IN WGS84

WILLETT POND DAM
NID# MA00169
LAT: 42.1812 N
LONG: -71.2330 W

JUNE 2009

FIGURE 2

NEPONSET RIVER LAND HOLDING ASSOCIATION

1,000 500 0 1,000 Feet

SCALE
HORZ: 1 INCH = 1,000 FEET
VERT:
DATUM
HORZ:
VERT:

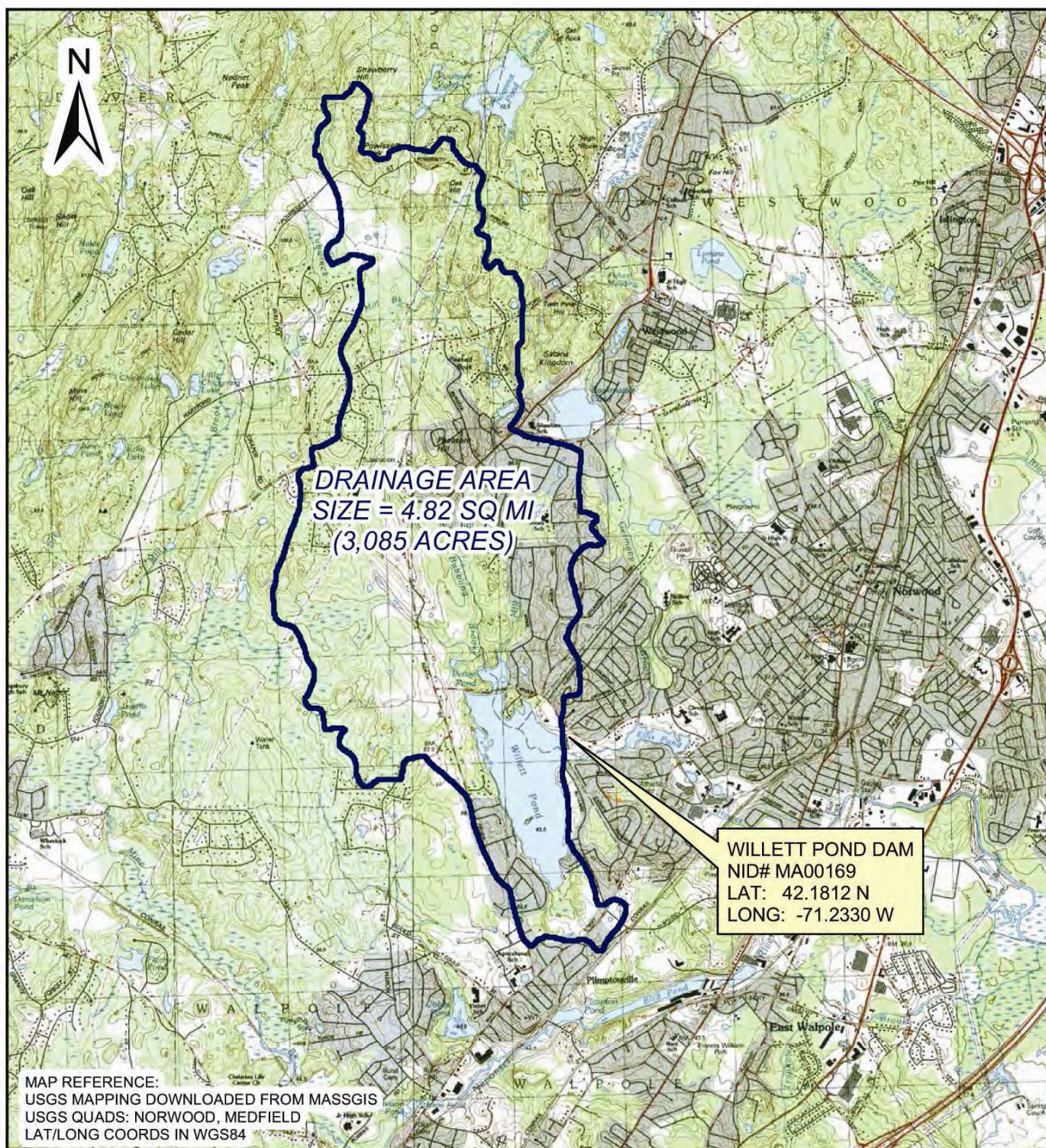
AERIAL PHOTOGRAPH

WILLETT POND DAM (MA00169)



F:\P2005\1323\A20\Phase I\GIS\20051323A20 mxd

NORWOOD/WALPOLE, MASSACHUSETTS



JUNE 2009

FIGURE 3

4,000 2,000 0 4,000 Feet

NEPONSET RIVER LANDHOLDING ASSOCIATION

SCALE

HORZ: 1 INCH = 4,000 FEET

VERT:

DATUM

HORZ:

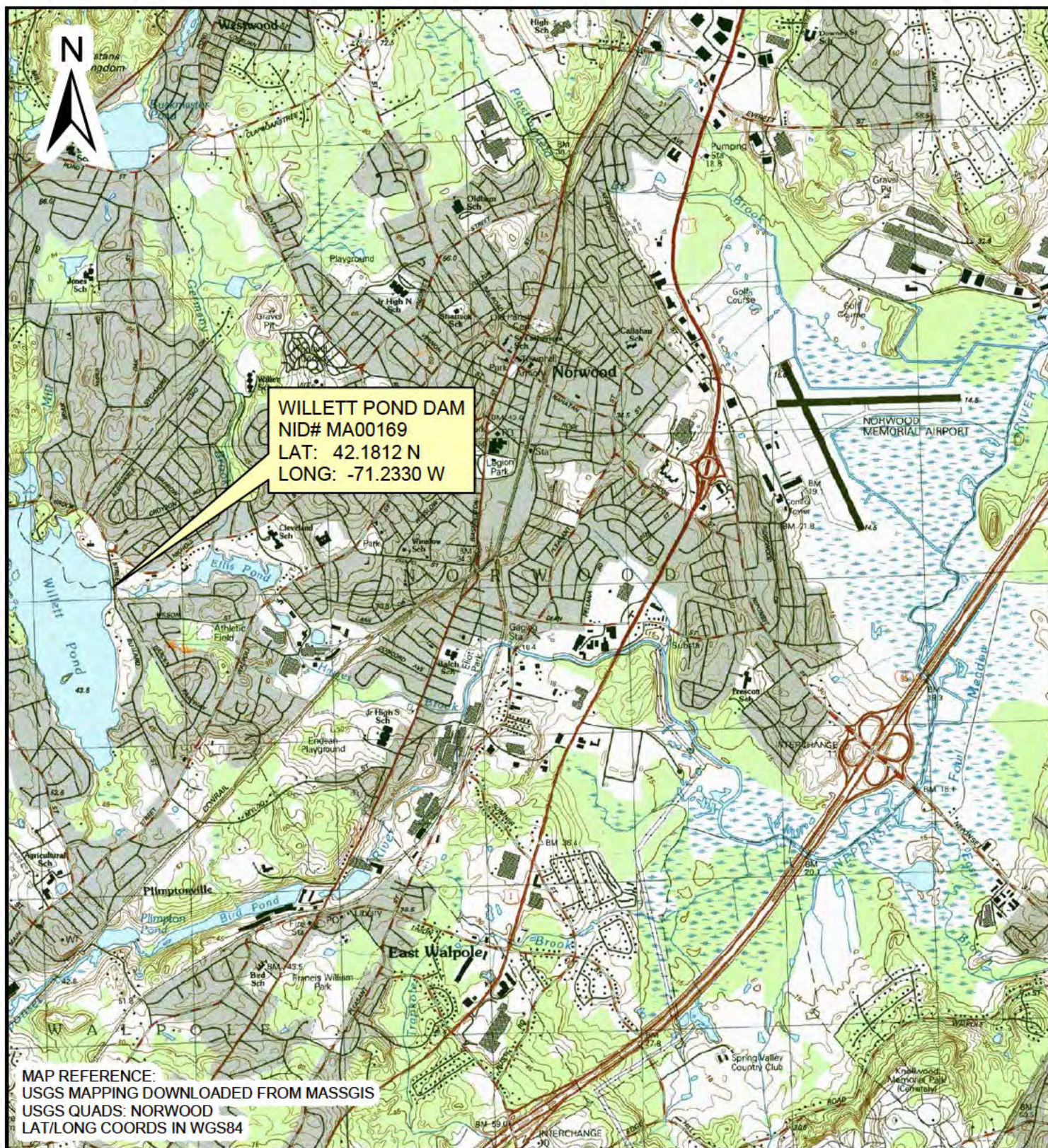
VERT: NGVD29 (3-METER CONTOURS)

**FUSS & O'NEILL***Disciplines to Deliver***DRAINAGE AREA**

WILLETT POND DAM (MA00169)

NORWOOD/WALPOLE, MASSACHUSETTS

F:\P2005\1323\A20\Phase I\GIS\20051323A20.mxd



SEPTEMBER 2009

FIGURE 4

3,000 1,500 0 3,000 Feet

NEPONSET RIVER LANDHOLDING ASSOCIATION

SCALE
 HORZ: 1 INCH = 3,000 FEET
 VERT:

DATUM
 HORZ:
 VERT: NGVD29 (3-METER CONTOURS)



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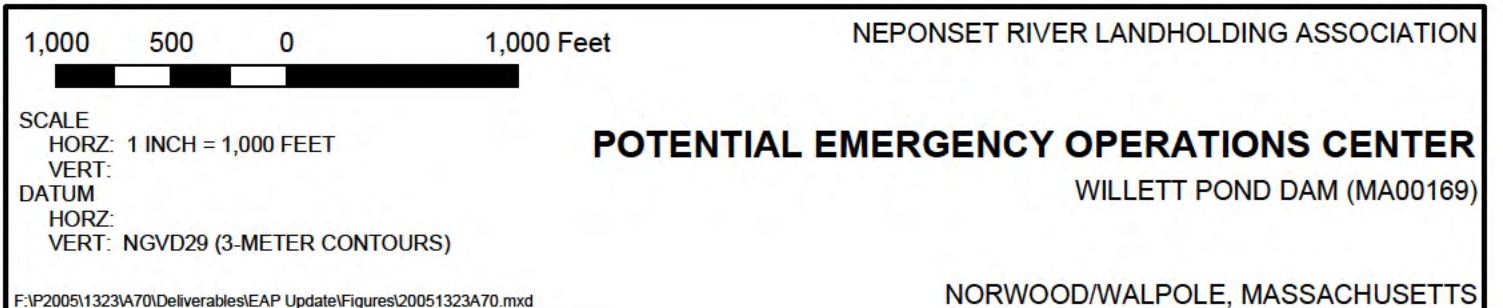
DOWNSTREAM AREA

WILLETT POND DAM (MA00169)



JUNE 2009

FIGURE 5



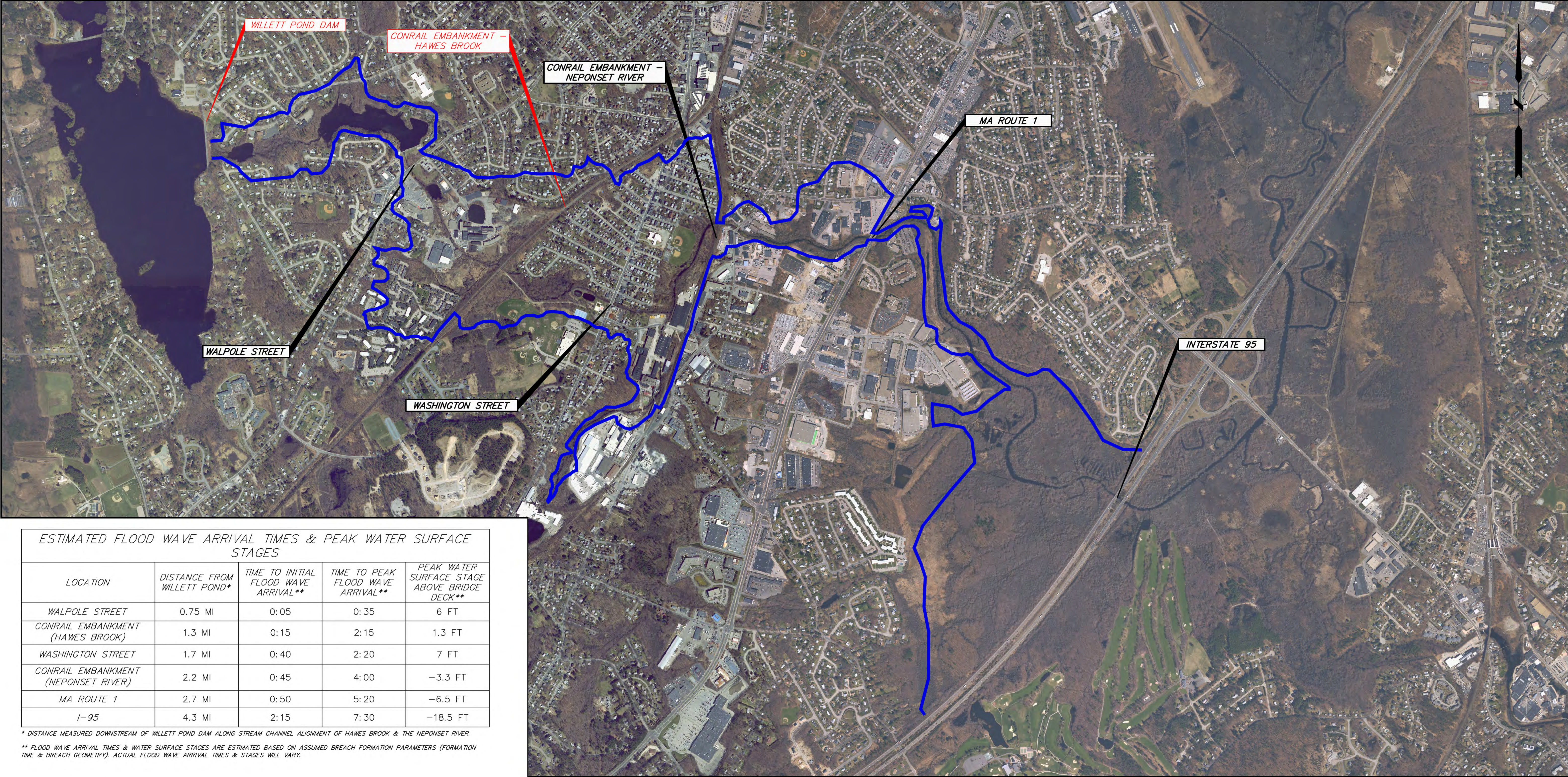
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CTB: FO_COLOR.ctb

L:\MAN DAM\0.5 PMF-AERIAL

MS VIEW: WVIEW_DB_DAM

UCS:



ESTIMATED FLOOD WAVE ARRIVAL TIMES & PEAK WATER SURFACE STAGES				
LOCATION	DISTANCE FROM WILLETT POND*	TIME TO INITIAL FLOOD WAVE ARRIVAL**	TIME TO PEAK FLOOD WAVE ARRIVAL**	PEAK WATER SURFACE STAGE ABOVE BRIDGE DECK**
WALPOLE STREET	0.75 MI	0:05	0:35	6 FT
CONRAIL EMBANKMENT (HAWES BROOK)	1.3 MI	0:15	2:15	1.3 FT
WASHINGTON STREET	1.7 MI	0:40	2:20	7 FT
CONRAIL EMBANKMENT (NEPONSET RIVER)	2.2 MI	0:45	4:00	-3.3 FT
MA ROUTE 1	2.7 MI	0:50	5:20	-6.5 FT
I-95	4.3 MI	2:15	7:30	-18.5 FT

* DISTANCE MEASURED DOWNSTREAM OF WILLETT POND DAM ALONG STREAM CHANNEL ALIGNMENT OF HAWES BROOK & THE NEPONSET RIVER.

** FLOOD WAVE ARRIVAL TIMES & WATER SURFACE STAGES ARE ESTIMATED BASED ON ASSUMED BREACH FORMATION PARAMETERS (FORMATION TIME & BREACH GEOMETRY). ACTUAL FLOOD WAVE ARRIVAL TIMES & STAGES WILL VARY.

LEGEND

- POTENTIALLY INUNDATED AREA
- RED TEXT DENOTES STRUCTURE ASSUMED TO BREACH

MAP REFERENCE:

AERIAL PHOTOGRAPHY FROM MassGIS*, DATED: 2005

* OFFICE OF GEOGRAPHIC & ENVIRONMENTAL INFORMATION, COMMONWEALTH OF MASS.
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

NOTE(S):

1. FAILURE OF WILLETT POND DAM ASSUMED DURING OCCURRENCE OF 1/2 OF THE PROBABLE MAXIMUM FLOOD (1/2PMF)

				PROJ. MANAGER:	SEAL	SEAL
				CHIEF DESIGNER:		
				REVIEWED BY:	DATE	
1.	DATE	DESCRIPTION	BY			
REVISIONS						

SCALE:	
HORZ.: 1" = 800'	VERT.: NA
DATUM:	
HORZ.: NA	VERT.: NA
800 400 0 800	
GRAPHIC SCALE	



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NEPONSET RIVER LAND HOLDING ASSOCIATION
INUNDATION MAP - BREACH OF WILLETT POND DAM
SCENARIO: SPILLWAY DESIGN FLOOD
WILLETT POND DAM & DIKE
NORWOOD
MASSACHUSETTS

PROJ. No.: 20051323.A10
DATE: REV. JUNE 2013

FIG 1A

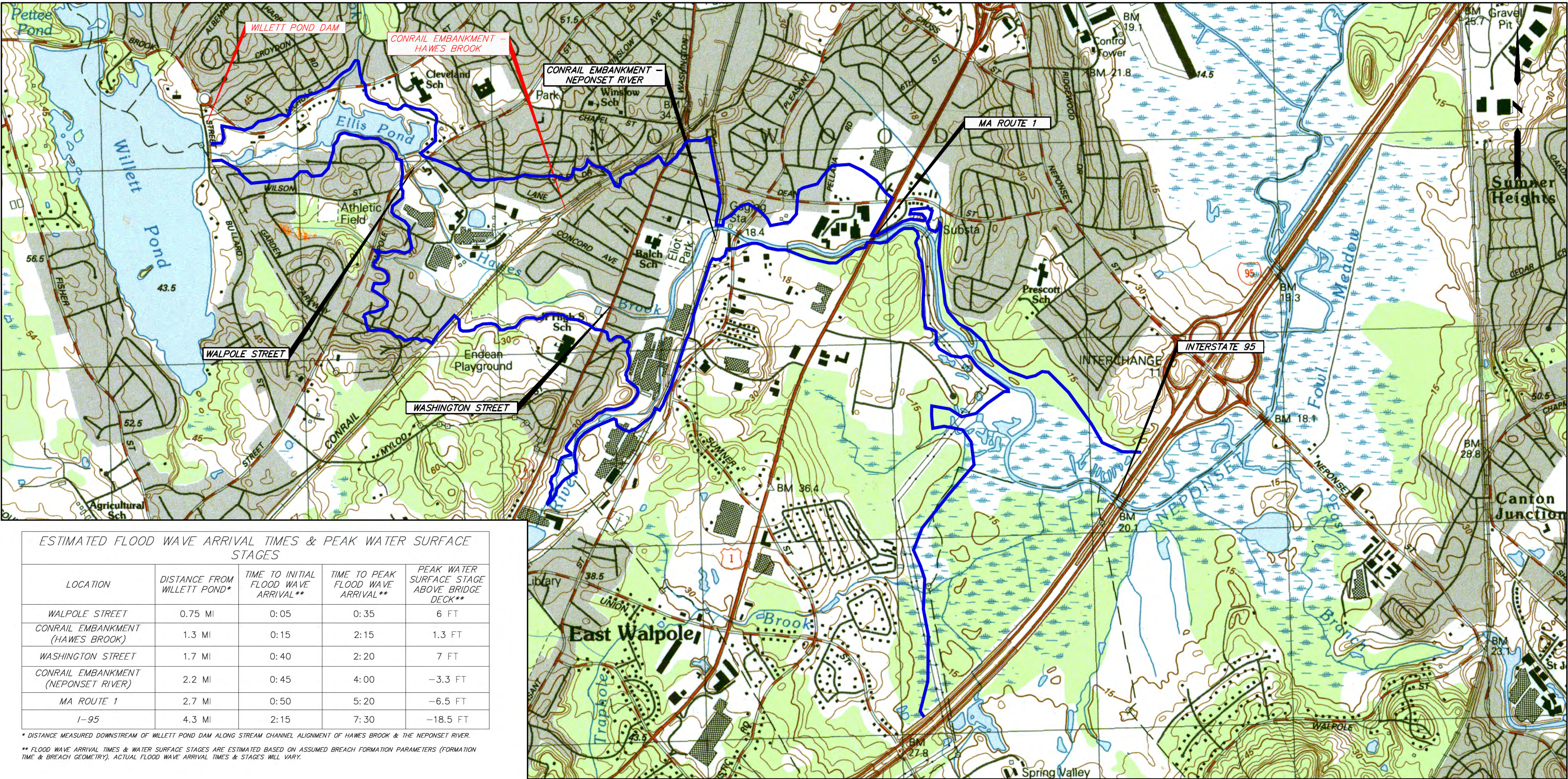
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CTB: F0_COLOR.ctb

LMAN: DAM 0.5 PMF-TOPO

MS VIEW: INVIEW_DB.DWG

UCS:



ESTIMATED FLOOD WAVE ARRIVAL TIMES & PEAK WATER SURFACE STAGES				
LOCATION	DISTANCE FROM WILLETT POND*	TIME TO INITIAL FLOOD WAVE ARRIVAL**	TIME TO PEAK FLOOD WAVE ARRIVAL**	PEAK WATER SURFACE STAGE ABOVE BRIDGE DECK**
WALPOLE STREET	0.75 MI	0:05	0:35	6 FT
CONRAIL EMBANKMENT (HAWES BROOK)	1.3 MI	0:15	2:15	1.3 FT
WASHINGTON STREET	1.7 MI	0:40	2:20	7 FT
CONRAIL EMBANKMENT (NEPONSET RIVER)	2.2 MI	0:45	4:00	-3.3 FT
MA ROUTE 1	2.7 MI	0:50	5:20	-6.5 FT
I-95	4.3 MI	2:15	7:30	-18.5 FT

* DISTANCE MEASURED DOWNSTREAM OF WILLETT POND DAM ALONG STREAM CHANNEL ALIGNMENT OF HAWES BROOK & THE NEPONSET RIVER.

** FLOOD WAVE ARRIVAL TIMES & WATER SURFACE STAGES ARE ESTIMATED BASED ON ASSUMED BREACH FORMATION PARAMETERS (FORMATION TIME & BREACH GEOMETRY). ACTUAL FLOOD WAVE ARRIVAL TIMES & STAGES WILL VARY.

LEGEND

- POTENTIALLY INUNDATED AREA
- RED TEXT DENOTES STRUCTURE ASSUMED TO BREACH

MAP REFERENCE:

BASE MAP CREATED FROM USGS TOPOGRAPHIC MAPPING, PROVIDED BY MassGIS*.

* OFFICE OF GEOGRAPHIC & ENVIRONMENTAL INFORMATION, COMMONWEALTH OF MASS. EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

NOTE(S):

1. FAILURE OF WILLETT POND DAM ASSUMED DURING OCCURRENCE OF 1/2 OF THE PROBABLE MAXIMUM FLOOD (1/2PMF)

						PROJ. MANAGER:	
						CHIEF DESIGNER:	
						REVIEWED BY:	DATE
1.							
No.	DATE	DESCRIPTION			BY		
REVISIONS							

		SEAL		SEAL	

SCALE:		HORZ.: 1" = 800'	
		VERT.: NA	
DATUM:		HORZ.: NA	
		VERT.: NA	
		800 400 0 800	
		GRAPHIC SCALE	



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NEPONSET RIVER LAND HOLDING ASSOCIATION
INUNDATION MAP - BREACH OF WILLETT POND DAM
SCENARIO: SPILLWAY DESIGN FLOOD
WILLETT POND DAM & DIKE
NORWOOD
MASSACHUSETTS

PROJ. No.: 20051323.A10
DATE: REV. JUNE 2013

FIG 1B



** FLOOD WAVE ARRIVAL TIMES & WATER SURFACE STAGES ARE ESTIMATED BASED ON ASSUMED BREACH FORMATION PARAMETERS (FORMATION TIME & BREACH GEOMETRY). ACTUAL FLOOD WAVE ARRIVAL TIMES & STAGES WILL VARY.

FIG 2A

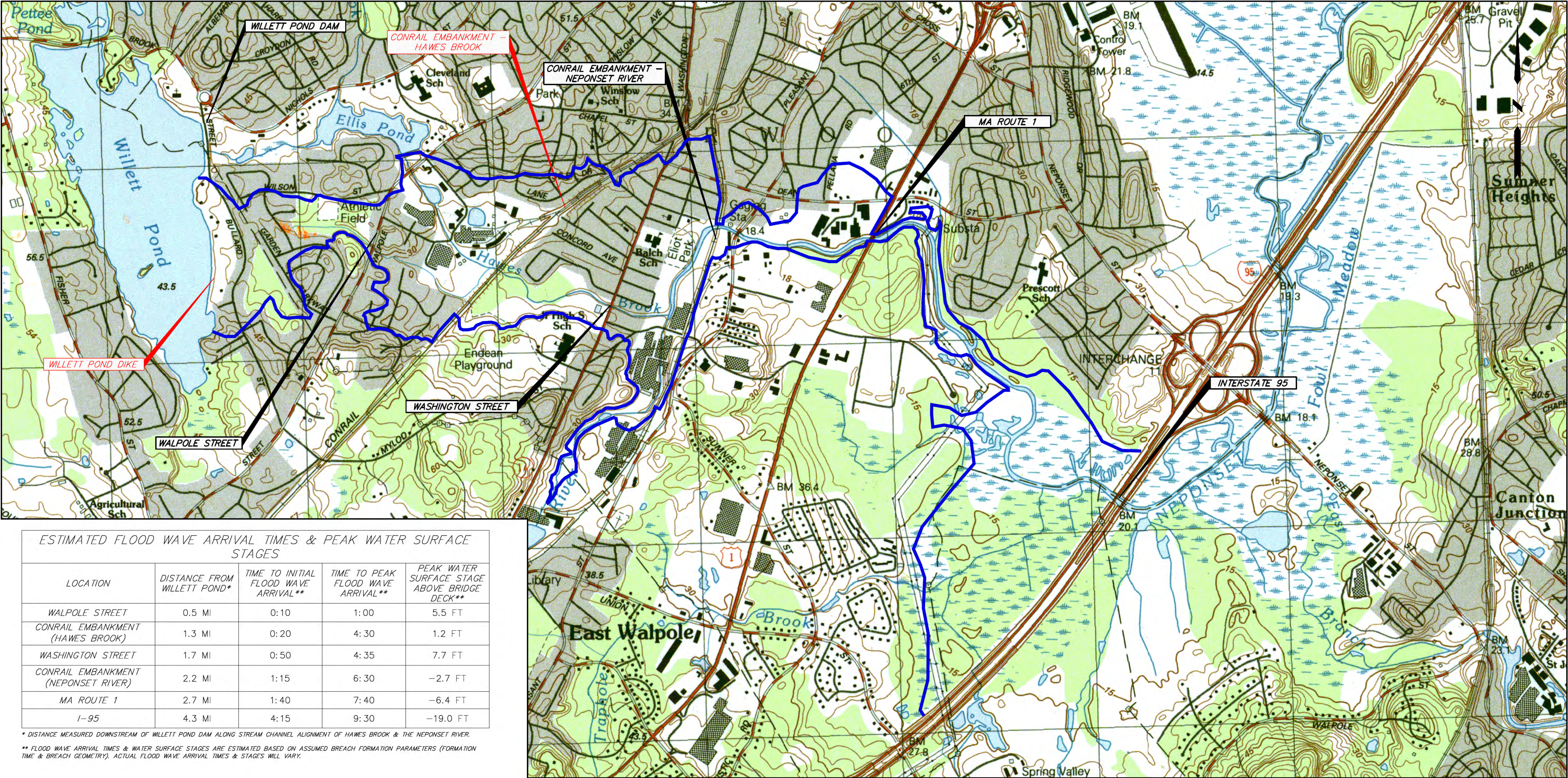
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CTB: FO_COLOR.ctb

LMAN DIKE 0.5 PMF-TOPO

MS VIEW: WVIEW.DB.DWG

UCS:



ESTIMATED FLOOD WAVE ARRIVAL TIMES & PEAK WATER SURFACE STAGES				
LOCATION	DISTANCE FROM WILLETT POND*	TIME TO INITIAL FLOOD WAVE ARRIVAL**	TIME TO PEAK FLOOD WAVE ARRIVAL**	PEAK WATER SURFACE STAGE ABOVE BRIDGE DECK**
WALPOLE STREET	0.5 MI	0:10	1:00	5.5 FT
CONRAIL EMBANKMENT (HAWES BROOK)	1.3 MI	0:20	4:30	1.2 FT
WASHINGTON STREET	1.7 MI	0:50	4:35	7.7 FT
CONRAIL EMBANKMENT (NEPONSET RIVER)	2.2 MI	1:15	6:30	-2.7 FT
MA ROUTE 1	2.7 MI	1:40	7:40	-6.4 FT
I-95	4.3 MI	4:15	9:30	-19.0 FT

* DISTANCE MEASURED DOWNSTREAM OF WILLETT POND DAM ALONG STREAM CHANNEL ALIGNMENT OF HAWES BROOK & THE NEPONSET RIVER.

** FLOOD WAVE ARRIVAL TIMES & WATER SURFACE STAGES ARE ESTIMATED BASED ON ASSUMED BREACH FORMATION PARAMETERS (FORMATION TIME & BREACH GEOMETRY). ACTUAL FLOOD WAVE ARRIVAL TIMES & STAGES WILL VARY.

LEGEND

- POTENTIALLY INUNDATED AREA
- RED TEXT DENOTES STRUCTURE ASSUMED TO BREACH

MAP REFERENCE:

BASE MAP CREATED FROM USGS TOPOGRAPHIC MAPPING. PROVIDED BY MassGIS*.

* OFFICE OF GEOGRAPHIC & ENVIRONMENTAL INFORMATION, COMMONWEALTH OF MASS. EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

NOTE(S):

1. FAILURE OF WILLETT POND DIKE ASSUMED DURING OCCURRENCE OF 1/2 OF THE PROBABLE MAXIMUM FLOOD (1/2PMF)

1.		PROJ. MANAGER:	
No.		CHIEF DESIGNER:	
DATE		REVIEWED BY:	
DESCRIPTION		DATE	
BY			
REVISIONS			

SEAL	SEAL
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SEAL	SEAL
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SEAL	SEAL
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SCALE:	
HORZ.: 1" = 800'	VERT.: NA
DATUM:	
HORZ.: NA	VERT.: NA
800 400 0 800	
GRAPHIC SCALE	





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NEPONSET RIVER LAND HOLDING ASSOCIATION
INUNDATION MAP - BREACH OF WILLETT POND DIKE
SCENARIO: SPILLWAY DESIGN FLOOD
WILLETT POND DAM & DIKE
NORWOOD
MASSACHUSETTS

PROJ. No.: 20051323.A10
DATE: REV. JUNE 2013

FIG 2B

				PROJ. MANAGER: CHIEF DESIGNER: REVIEWED BY: DATE		SEAL	SEAL	SCALE: HORZ.: 1" = 800' VERT.: NA DATUM: HORZ.: NA VERT.: NA  GRAPHIC SCALE		 FUSS & O'NEILL <i>Disciplines to Deliver</i> 78 INTERSTATE DRIVE, WEST SPRINGFIELD, MA 01089 413.452.0445 www.FandO.com		NEPONSET RIVER LAND HOLDING ASSOCIATION INUNDATION MAP - BREACH OF WILLETT POND DAM SCENARIO: SUNNY DAY CONDITIONS WILLETT POND DAM & DIKE NORWOOD MASSACHUSETTS		PROJ. No.: 20051323.A10 DATE: REV: JUNE 2013 <h1>FIG 4A</h1>	
1. DATE DESCRIPTION BY															
REVISIONS															

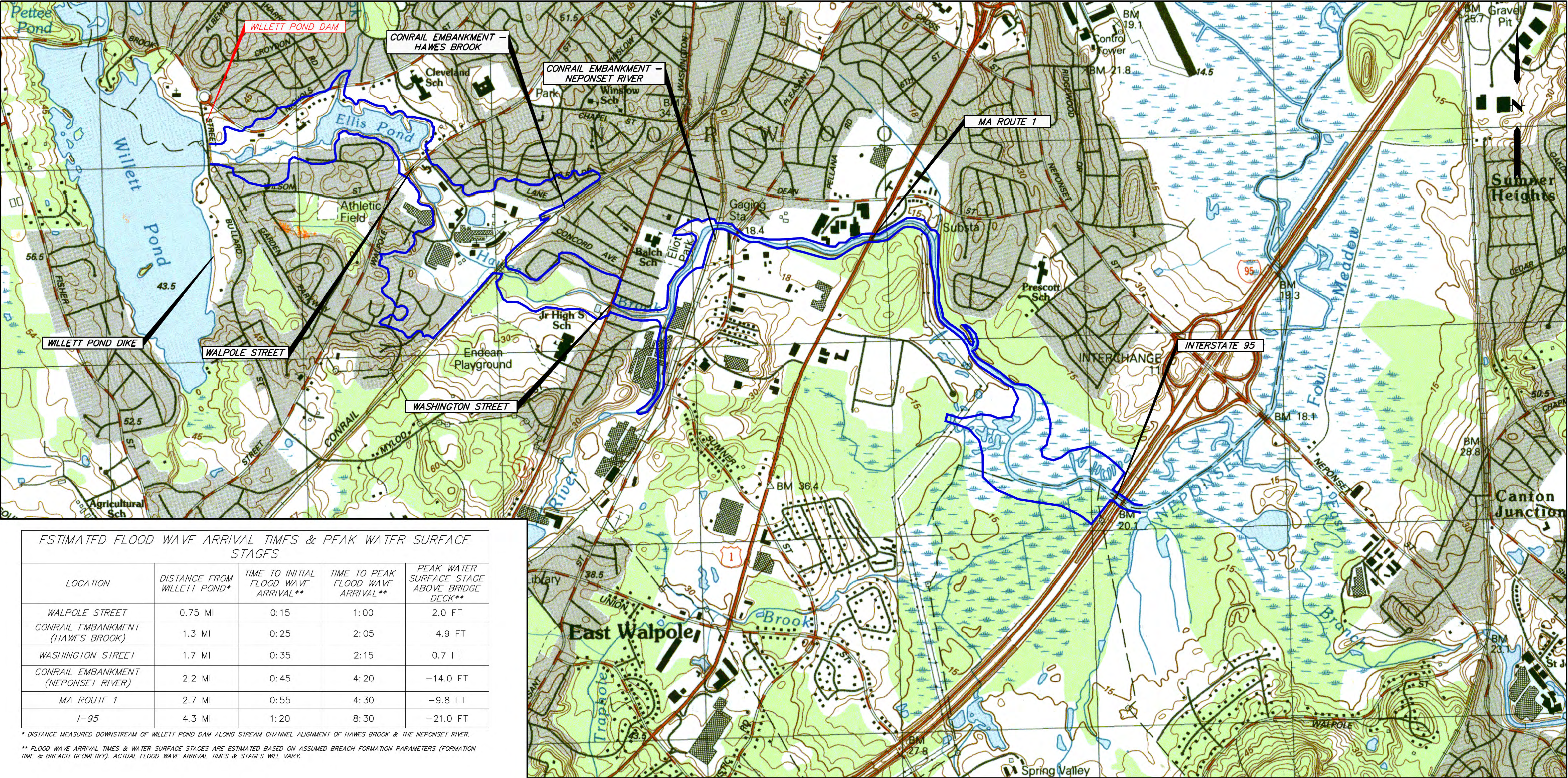
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CTB: F0_COLOR.ctb

LMAN DAM SUNNY DAY-TOPO

MS VIEW: WVIEW_DB_DAM

UCS:



ESTIMATED FLOOD WAVE ARRIVAL TIMES & PEAK WATER SURFACE STAGES				
LOCATION	DISTANCE FROM WILLETT POND*	TIME TO INITIAL FLOOD WAVE ARRIVAL**	TIME TO PEAK FLOOD WAVE ARRIVAL**	PEAK WATER SURFACE STAGE ABOVE BRIDGE DECK**
WALPOLE STREET	0.75 MI	0:15	1:00	2.0 FT
CONRAIL EMBANKMENT (HAWES BROOK)	1.3 MI	0:25	2:05	-4.9 FT
WASHINGTON STREET	1.7 MI	0:35	2:15	0.7 FT
CONRAIL EMBANKMENT (NEPONSET RIVER)	2.2 MI	0:45	4:20	-14.0 FT
MA ROUTE 1	2.7 MI	0:55	4:30	-9.8 FT
I-95	4.3 MI	1:20	8:30	-21.0 FT

* DISTANCE MEASURED DOWNSTREAM OF WILLETT POND DAM ALONG STREAM CHANNEL ALIGNMENT OF HAWES BROOK & THE NEPONSET RIVER.

** FLOOD WAVE ARRIVAL TIMES & WATER SURFACE STAGES ARE ESTIMATED BASED ON ASSUMED BREACH FORMATION PARAMETERS (FORMATION TIME & BREACH GEOMETRY). ACTUAL FLOOD WAVE ARRIVAL TIMES & STAGES WILL VARY.

LEGEND

- POTENTIALLY INUNDATED AREA
- RED TEXT DENOTES STRUCTURE ASSUMED TO BREACH

MAP REFERENCE:

BASE MAP CREATED FROM USGS TOPOGRAPHIC MAPPING. PROVIDED BY MassGIS*.

* OFFICE OF GEOGRAPHIC & ENVIRONMENTAL INFORMATION, COMMONWEALTH OF MASS. EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

NOTE(S):

1. FAILURE OF WILLETT POND DAM ASSUMED DURING OCCURRENCE OF SUNNY DAY (NORMAL WATER SURFACE ELEVATION) DAM BREACH

1.		PROJ. MANAGER:		SEAL	
No.		CHIEF DESIGNER:		SEAL	
DATE		REVIEWED BY:			
DESCRIPTION		DATE			
BY					
REVISIONS					

SCALE:	
HORZ.: 1" = 800'	VERT.: NA
DATUM:	
HORZ.: NA	VERT.: NA
800 400 0 800	
GRAPHIC SCALE	

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INUNDATION MAP - BREACH OF WILLETT POND DAM

SCENARIO: SUNNY DAY CONDITIONS

WILLETT POND DAM & DIKE

NORWOOD MASSACHUSETTS

PROJ. No.: 20051323.A10

DATE: REV. JUNE 2013

FIG 4B

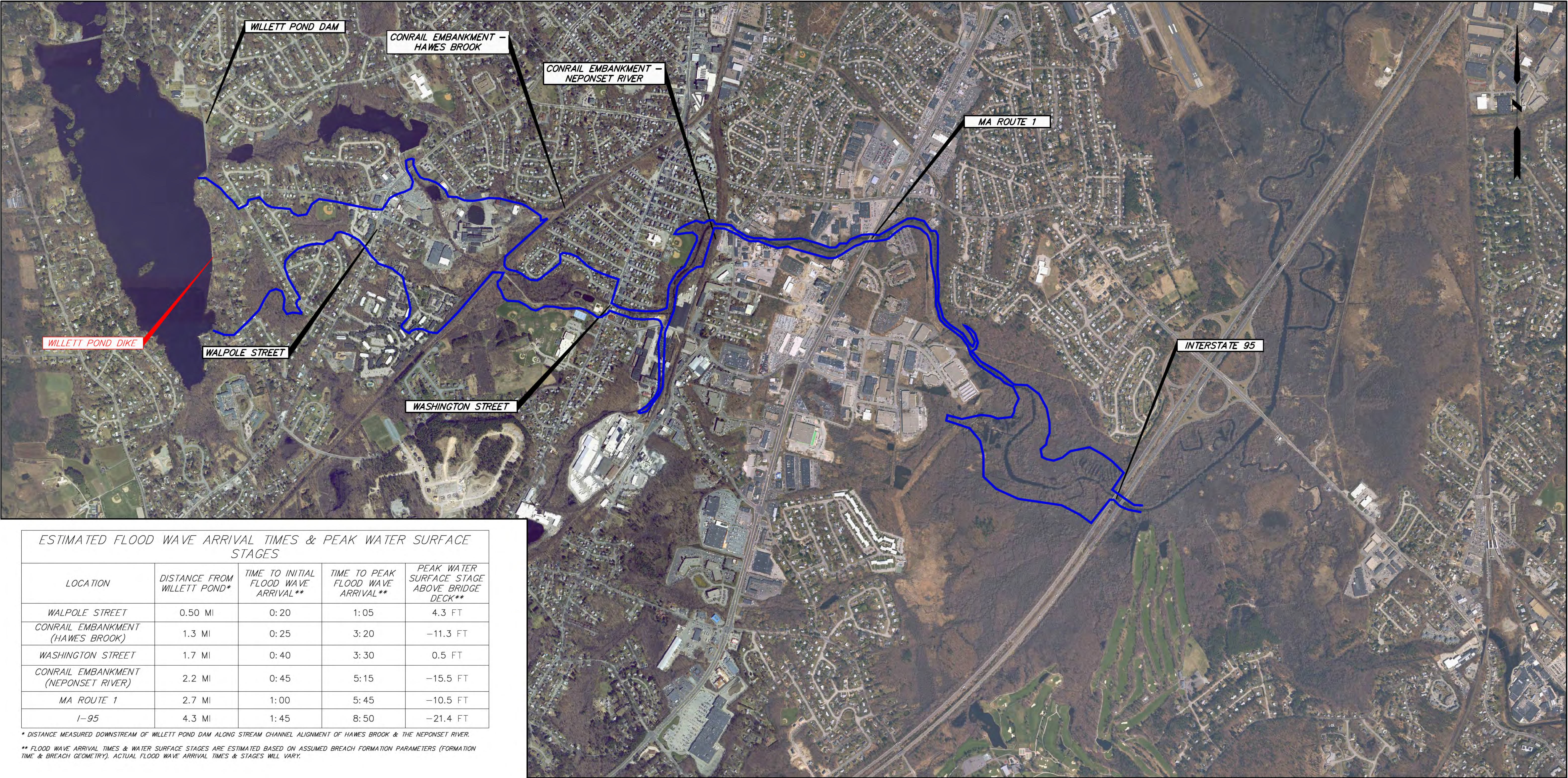
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CTB: FO_COLOR.ctb

LMAN DIKE SUNNY DAY-AERIAL

MS VIEW: WVIEW_DB_DAM

UCS:



ESTIMATED FLOOD WAVE ARRIVAL TIMES & PEAK WATER SURFACE STAGES

LOCATION	DISTANCE FROM WILLETT POND*	TIME TO INITIAL FLOOD WAVE ARRIVAL**	TIME TO PEAK FLOOD WAVE ARRIVAL**	PEAK WATER SURFACE STAGE ABOVE BRIDGE DECK**
WALPOLE STREET	0.50 MI	0:20	1:05	4.3 FT
CONRAIL EMBANKMENT (HAWES BROOK)	1.3 MI	0:25	3:20	-11.3 FT
WASHINGTON STREET	1.7 MI	0:40	3:30	0.5 FT
CONRAIL EMBANKMENT (NEPONSET RIVER)	2.2 MI	0:45	5:15	-15.5 FT
MA ROUTE 1	2.7 MI	1:00	5:45	-10.5 FT
I-95	4.3 MI	1:45	8:50	-21.4 FT

* DISTANCE MEASURED DOWNSTREAM OF WILLETT POND DAM ALONG STREAM CHANNEL ALIGNMENT OF HAWES BROOK & THE NEPONSET RIVER.

** FLOOD WAVE ARRIVAL TIMES & WATER SURFACE STAGES ARE ESTIMATED BASED ON ASSUMED BREACH FORMATION PARAMETERS (FORMATION TIME & BREACH GEOMETRY). ACTUAL FLOOD WAVE ARRIVAL TIMES & STAGES WILL VARY.

LEGEND

- POTENTIALLY INUNDATED AREA
- RED TEXT DENOTES STRUCTURE ASSUMED TO BREACH

MAP REFERENCE:

AERIAL PHOTOGRAPHY FROM MassGIS*, DATED: 2005

* OFFICE OF GEOGRAPHIC & ENVIRONMENTAL INFORMATION, COMMONWEALTH OF MASS.
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

NOTE(S):

1. FAILURE OF WILLETT POND DIKE ASSUMED DURING OCCURRENCE OF SUNNY DAY (NORMAL WATER SURFACE ELEVATION) DAM BREACH

				PROJ. MANAGER:		SEAL		SEAL	
				CHIEF DESIGNER:					
				REVIEWED BY:	DATE				
1.									
No.	DATE	DESCRIPTION	BY						
		REVISIONS							

SCALE:	
HORZ.: 1" = 800'	
VERT.: NA	
DATUM:	
HORZ.: NA	
VERT.: NA	
800 400 0 800	
GRAPHIC SCALE	



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INUNDATION MAP - BREACH OF WILLETT POND DIKE
SCENARIO: SUNNY DAY CONDITIONS
WILLETT POND DAM & DIKE
NORWOOD
MASSACHUSETTS

PROJ. No.: 20051323.A10
DATE: REV. JUNE 2013

FIG 5A

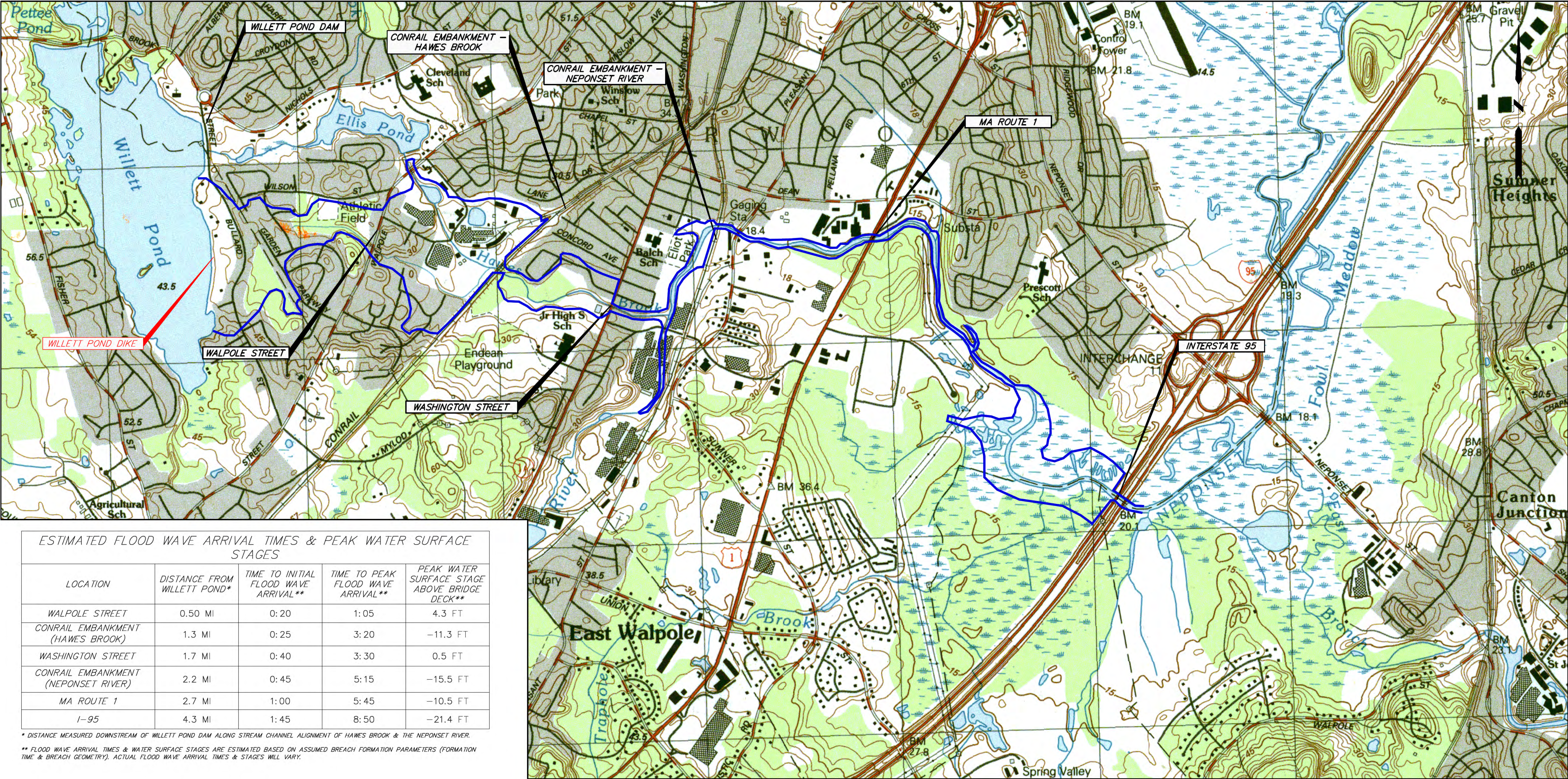
File Path: J:\DWG\2005\1323A10\Plan051323A10STD01.dwg, Layout: FIG 5B, Mon, Jun 10, 2013, 4:00 PM, User: kmkolinski

CTB: F0_COLOR.ctb

LMAN DIKE SUNNY DAY-TOPO

MS VIEW: WVIEW_DB_DAM

UCS:



ESTIMATED FLOOD WAVE ARRIVAL TIMES & PEAK WATER SURFACE STAGES				
LOCATION	DISTANCE FROM WILLETT POND*	TIME TO INITIAL FLOOD WAVE ARRIVAL**	TIME TO PEAK FLOOD WAVE ARRIVAL**	PEAK WATER SURFACE STAGE ABOVE BRIDGE DECK**
WALPOLE STREET	0.50 MI	0:20	1:05	4.3 FT
CONRAIL EMBANKMENT (HAWES BROOK)	1.3 MI	0:25	3:20	-11.3 FT
WASHINGTON STREET	1.7 MI	0:40	3:30	0.5 FT
CONRAIL EMBANKMENT (NEPONSET RIVER)	2.2 MI	0:45	5:15	-15.5 FT
MA ROUTE 1	2.7 MI	1:00	5:45	-10.5 FT
I-95	4.3 MI	1:45	8:50	-21.4 FT

* DISTANCE MEASURED DOWNSTREAM OF WILLETT POND DAM ALONG STREAM CHANNEL ALIGNMENT OF HAWES BROOK & THE NEPONSET RIVER.

** FLOOD WAVE ARRIVAL TIMES & WATER SURFACE STAGES ARE ESTIMATED BASED ON ASSUMED BREACH FORMATION PARAMETERS (FORMATION TIME & BREACH GEOMETRY). ACTUAL FLOOD WAVE ARRIVAL TIMES & STAGES WILL VARY.

LEGEND

- POTENTIALLY INUNDATED AREA
- RED TEXT DENOTES STRUCTURE ASSUMED TO BREACH

MAP REFERENCE:

AERIAL PHOTOGRAPHY FROM MassGIS*, DATED: 2005

* OFFICE OF GEOGRAPHIC & ENVIRONMENTAL INFORMATION, COMMONWEALTH OF MASS. EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

NOTE(S):

1. FAILURE OF WILLETT POND DIKE ASSUMED DURING OCCURRENCE OF SUNNY DAY (NORMAL WATER SURFACE ELEVATION) DAM BREACH

1.		PROJ. MANAGER:		SEAL	
No.		CHIEF DESIGNER:		SEAL	
DATE		REVIEWED BY:			
DESCRIPTION		DATE			
BY					
REVISIONS					

PROJ. MANAGER:	
CHIEF DESIGNER:	
REVIEWED BY:	
DATE	

SEAL	
SEAL	

SCALE:	
HORZ.: 1" = 800'	
VERT.: NA	
DATUM:	
HORZ.: NA	
VERT.: NA	
800 400 0 800	
GRAPHIC SCALE	

SCALE:	
HORZ.: 1" = 800'	
VERT.: NA	
DATUM:	
HORZ.: NA	
VERT.: NA	
800 400 0 800	
GRAPHIC SCALE	

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INUNDATION MAP - BREACH OF WILLETT POND DIKE	
SCENARIO: SUNNY DAY CONDITIONS	
WILLETT POND DAM & DIKE	
NORWOOD	
MASSACHUSETTS	

PROJ. No.: 20051323.A10	
DATE: REV. JUNE 2013	
FIG 5B	

Appendix A

Residents/Business/Highways/Dams at Risk



Appendix A

Residents/Businesses/Highways/Dams at Risk

A major flood caused by a sudden breach of the dam could affect more than 1,300 downstream properties with structures. Two railroads, Route 1, Route I-95, and more than 70 local roads also lie within the inundation area. Three dams also are located downstream of Willett Pond Dam.

Affected properties are included in *Table A-1* below. Timing of the flood wave and depth of overtopping are included further below in *Tables A-2 through A-5*, and are shown on *Figures 6 through 13*.

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
Richard D	White			Both
Helen J	Rossetsky			Both
Jennie	M ke			Both
Not Found	Not Found			Both
Not Found	Not Found			Both
Steven G	Fahrenholt			Both
Not Found	Not Found			Both
James W	Rossetsky			Both
Joseph M Jr	Ray			Both
Maximo M	Lopez			Both
Nicholas P	Cotelleso			Both
Gerard J	Cullinane			Both
Mauricio M	Filho			Both
Sharyce A	Dechristofor			Both
Not Found	Not Found			Both
Irene F	Reilly			Both
Stephen	Keaney			Both
		Wacky Women Wanderers		Both
Richard M Jr	Roche			Both
Kimberly A	McKinnon			Both
David P	Schermerhorn			Both
Not Found	Not Found			Both
Bernadette G	Campbell			Both
Michael P	Burtman			Both
Jacob E Jr	Low			Both
Paul L	White			Both
Not Found	Not Found			Both
Not Found	Not Found			Both
William L	Dailey			Both
Elias	Habr			Both
John J	Moynihan			Both
Not Found	Not Found			Both
George W	Ringler			Both
Josephine M	Ciavattone			Both
Not Found	Not Found			Both
Steven M	McDonough			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of **Dam or Dike** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Phillip	Salvucci			Both
	Samija	Delic			Both
			A New Beginning In Hair Design		Both
	Ann-marie M	Heavey			Both
	Ramon S	Lopez			Both
	Patricia L	McCoy			Both
	Not Found	Not Found			Both
	Matthew M Jr	Shanahan			Both
	Audrey J	Cook			Both
	Christopher W	Belcher			Both
	Not Found	Not Found			Both
	Ludger I	Veer			Both
	Richard R Jr	Farnsworth			Both
	John T	Boudreau			Both
	Peter T	Varitimos			Both
	Robert M	Hogan			Both
	Robert A	Chrusciel			Both
	Joan M	White			Both
	Nicole M	Dana			Both
	David R	Boyden			Both
	Elaine M	Donohue			Both
	Scott F	Ivatts			Both
	Frances	Zinfolino			Both
	Deborah S	Liu			Both
	Kenneth A	Hardy			Both
	Not Found	Not Found			Both
	Thomas J	Guid			Both
	Not Found	Not Found			Both
	Meredith	Mahoney			Both
	Meredith	Mahoney			Both
	Meredith	Mahoney			Both
	Meredith	Mahoney			Both
	Eric S	Niblack			Both
	Meredith	Mahoney			Both
	David S	Goyco			Both
	Alicia & David	Goyco			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
			ST George Orthodox Church		Both
	Michael P	M ke			Both
	Michael P	M ke			Both
	Michael P	M ke			Both
	C	M ke			Both
	C	M ke			Both
	C	M ke			Both
	Caryn A	Young			Both
	Not Found	Not Found			Both
	Ibrahim S	Fadel			Both
	Catherine B	Bartell			Both
	Joseph M	Kimmett			Both
	Mostafa	Abolmasomi			Both
	Not Found	Not Found			Both
	James & Rachel	Piazza			Both
	James J	Piazza			Both
	Not Found	Not Found			Both
	T	Cronin			Both
	T	Cronin			Both
	T	Cronin			Both
	Mark F	Finn			Both
	T	Cronin			Both
	Tricia M	Cronin			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Richard	Malacaria			Both
	Richard	Malacaria			Both
	Barbara J	Lanzoni			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Judith A	Smith			Both
	Sarah	Inzodda			Both
	Sarah	Inzodda			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	D	Barss			Both
	Kathleen A	Whelan			Both
	Edward	Martin			Both
	Dave & Barbara	Curran			Both
	Dave & Barbara	Curran			Both
	Dave & Barbara	Curran			Both
	Dave & Barbara	Curran			Both
	Fred	Babel			Both
	John S	Falcone			Both
	Not Found	Not Found			Both
	Josep	Parkhurst			Both
	Marion F	Roy			Both
			Georgian Communications		Both
	Bette	Reilly			Both
	Bernard N	Troilo			Both
	Anthony J Jr	Troilo			Both
	Frederick R Jr	Beaton			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Ed	Rasmussen			Both
	Rhoda A	Linehan			Both
	William J	Kates			Both
	Richard A Sr	Lind			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Not Found	Not Found			Both
	Brian J	Morris			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Nancy	Madanick			Both
	Nancy	Madanick			Both
	Thomasa	Karabaly			Both
	Jeff & Kristen	McGourty			Both
	Jeff & Kristen	McGourty			Both
	Hans	Waldmann			Both
	Charles	Mitchell			Both
	Meryl J	Wolfson			Both
	George L	Kilnapp			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
			Brake & Alignment Specialist &		Both
	Rohiah	Taggart			Both
	William R	Nutting			Both
	Gerald J	Haruki			Both
	Not Found	Not Found			Both
	Caitlyn	Carr			Both
	Joao	Castro			Both
	Not Found	Not Found			Both
	Khiemel	Smith			Both
	Arthur H	Branco			Both
	Hunain Y	Karwashan			Both
	Marcia	Khan			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	George	Mouawad			Both
	Ron C	Fitzgerald			Both
	Walter	Fitzgerald			Both
	Joyce B	Boulis			Both
	Nicholas V	Puopolo			Both
	Nicholas V	Puopolo			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Not Found	Not Found		Not Found	Both
	Bernard I Jr	Stone			Both
	Sherri	Shafman			Both
	Sherri	Shafman			Both
	Not Found	Not Found			Both
	Michael J Jr	Murphy			Both
	Kate	Costello			Both
	Kate	Costello			Both
	Joyce E	Kaseta			Both
	Paul J	Oneil			Both
	Lisa	Repucci			Both
	Joseph H	Succar			Both
	Jennifer L	Bautista			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	David	Collins			Both
	David F	Collins			Both
			Lecture Management		Both
	Joseph	Sylanski			Both
	Joseph	Sylanski			Both
	Augusta	Caneja			Both
	Yacoub N	Melhem			Both
	William C	Curran			Both
	William T	Okeefe			Both
	Robert L	Rogers			Both
	Not Found	Not Found			Both
	Sandra	Thibeault			Both
	Sandra	Thibeault			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Peter G	Joseph			Both
	Bruce C	Ingram			Both
	Matthew V	Reiling			Both
	Debra	Rowell			Both
	Gina	Dalton			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Ali	Marhamo			Both
	Regina	Pasquantonio			Both
	Michelle	Wilmont			Both
	Xiu Liu	Liu			Both
	Xiu Liu	Liu			Both
	Xiu Liu	Liu			Both
	Gerald J	Corcoran			Both
	Pamela	O'Leary			Both
	Pamela	O'Leary			Both
	Pamela	O'Leary			Both
	Pamela	O'Leary			Both
	Pamela B	Oleary			Both
	Janeen	Malinn			Both
	Janeen	Malinn			Both
	Dwayne	Gooch			Both
	Brian J	Hebner			Both
	Randall S	Bourne			Both
	Randall	Bourne			Both
	Randall	Bourne			Both
	Randall	Bourne			Both
	Randall	Bourne			Both
	Marilyn L	Decoste			Both
	Randall	Bourne			Both
	Randall	Bourne			Both
	Randall	Bourne			Both
	Randall	Bourne			Both
	Not Found	Not Found			Both
	Kennith W	Richard			Both
	G	Faria			Both
	G	Faria			Both
	G	Faria			Both
	G	Faria			Both
	John R	Luise			Both
	Not Found	Not Found			Both
	Melissa	Black			Both
	Melissa	Black			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Shauna E	Campbell			Both
	James P	Oconnor			Both
	Jas P	O'Connor			Both
	Not Found	Not Found			Both
			New Wave Electronic Services		Both
			Colantuoni Brothers Corporation		Both
	Paschal	Ngwu			Both
	Paschal	Ngwu			Both
	Paschal	Ngwu			Both
	Not Found	Not Found			Both
	Joseph	Mastrianni			Both
	Joseph	Mastrianni			Both
	Joseph	Mastrianni			Both
	Joseph	Mastrianni			Both
	Joseph	Mastrianni			Both
	Not Found	Not Found			Both
	Kevin S	Dyke			Both
	Kevin S	Dyke			Both
	Kevin S	Dyke			Both
	Kevin S	Dyke			Both
	Kevin S	Dyke			Both
	Kevin S	Dyke			Both
	Lana	Joseph			Both
	Lana	Joseph			Both
	Lana	Joseph			Both
	Lana	Joseph			Both
	Lana	Joseph			Both
	Lana	Joseph			Both
	Maria	Andrade			Both
	Maria	Andrade			Both
	Maria	Andrade			Both
	Maria	Andrade			Both
	Maria	Andrade			Both
	Maria	Andrade			Both
	Kim J	Bennett			Both
	Not Found	Not Found			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Dung	Huynh			Both
	Dung	Huynh			Both
	Dung	Huynh			Both
	Dung	Huynh			Both
	John C	Martinsen			Both
	Dung	Huynh			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Jiba	Acharya			Both
	George A	Derderian			Both
	Jiba	Acharya			Both
	Jafar A	Ghadbouni			Both
	Jiba	Acharya			Both
	Jiba	Acharya			Both
	Jiba	Acharya			Both
	Jiba	Acharya			Both
	Jiba	Acharya			Both
	Jiba	Acharya			Both
	Not Found	Not Found			Both
	Yehya	Mansour			Both
	Yehya	Mansour			Both
	Yehya	Mansour			Both
	Cheryl A	Ayoub			Both
	Olga L	Kelley			Both
	Dennis J	McGranary			Both
	D	Coyne			Both
	D	Coyne			Both
	D	Coyne			Both
	Not Found	Not Found			Both
	Jay	Nelson			Both
	Kevin J	Howard			Both
	Not Found	Not Found			Both
	Melinda	Commane			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	William F	Morrissey			Both
	John G	Leombruno			Both
	John E	Howard			Both
	Leroy W	Gebhardt			Both
	Not Found	Not Found			Both
	James M	Thompson			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Joyce	Roof			Both
	Thiago	Cordeiro			Both
			Rossi A Constr Co Inc		Both
			Innovative Membrane Systems		Both
			Innovative Membrane Systems		Both
	Frank A	Fraone			Both
			Veterans Of Foreign Wars		Both
			Veterans Of Foreign Wars		Both
	Michael J	Bennett			Both
	Agnes M	Dauphinais			Both
	Paul D	Andrews			Both
	Not Found	Not Found			Both
			Stashs Pizza Of Norwood		Both
	Paul L	McNeil			Both
	Not Found	Not Found			Both
			Richardson L J Oil Co		Both
	Michael	Porazzo			Both
	Paul	Deminico			Both
	Mathew J	Kubik			Both
	David P	McFarland			Both
	Paul	Deminico			Both
	Paul	Deminico			Both
	Joan	Shepherd			Both
	Michael	Brennan			Both
	Joan M	Paquin			Both
	Michael	Brennan			Both
	Michael	Brennan			Both
	Donna M	Lee			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Michael T	Brennan			Both
	Lucy L	Marrone			Both
	John J	Bullistrum			Both
	Kathleen M	Kelliher			Both
	John J	Bullistrum			Both
	John J	Bullistrum			Both
	Bernadette O	Bullistrum			Both
	James T	McKenna			Both
	Janet M	Bruno			Both
	Janet M	Bruno			Both
	Janet M	Bruno			Both
	Janet M	Bruno			Both
	Karalyn M	Harland			Both
	Beatrice A	Parks			Both
	Stephen M	Terrenzi			Both
	Steven J	Eosco			Both
	William E Sr	Wenstrom			Both
	John L Sr	Maceachern			Both
	John & Loretta	Maceachern			Both
	John & Loretta	Maceachern			Both
			Applied Plastics Co Inc		Both
			Livermore H F		Both
	Robert A	Arnold			Both
	Paul A	Vezina			Both
			American Ink & Oil Corp		Both
	Not Found	Not Found			Both
	Erica	Bernard			Both
	Erica	Bernard			Both
	Christine	Belanger			Both
	Christine M	Belanger			Both
	Michael E	Walsh			Both
	Shauna L	Roberts			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Not Found	Not Found			Both
	Richard M	Ferrucci			Both
	John	Licciardi			Both
	John	Licciardi			Both
	Elizabeth	Hawk			Both
	Elizabeth	Hawk			Both
	Hamid I	Daaboul			Both
	John W	McTernan			Both
	Kristen	Bere			Both
	Kristen	Bere			Both
	Kristen	Bere			Both
	Kristen M	Bere			Both
	John R	Bernyk			Both
	Not Found	Not Found			Both
	Joaquim	Braga			Both
	Charles M	Croce			Both
	Emaline	Eakle			Both
	Emaline	Eakle			Both
	Cathy A	Kerr			Both
	Not Found	Not Found			Both
	George M	Kozak			Both
	Helen K	Kozak			Both
	H	Caneja			Both
	Horacio F	Caneja			Both
	Domingos A	Antas			Both
	David K	Matthews			Both
	Not Found	Not Found			Both
	Manuel	Neves			Both
	Manuel	Neves			Both
	Dc	Garnhum			Both
	L	Harwood			Both
	L	Harwood			Both
	Jean E	Baker			Both
	Jean E	Baker			Both
	Joseph	Cardinale			Both
	Joseph	Cardinale			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Joseph	Cardinale			Both
	Monet	Ryan			Both
	Eleanor	Puzin			Both
	Philip	Saad			Both
	Charles T	Moseley			Both
	Gabriel	Piccirilli			Both
	Robt T & Mary A	Bodge			Both
	Mary B	Bodge			Both
	William B	Troilo			Both
	Laila A	Esber			Both
	Z	Sal ba			Both
	Not Found	Not Found			Both
	Nicholas A	Dimartino			Both
	Larry D	Marzuolo			Both
	Lawrence	Marzuolo			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Vincent	Grudinskas			Both
	Vincent	Grudinskas			Both
	Not Found	Not Found			Both
	Michael	Wilbur			Both
	Not Found	Not Found			Both
	Rebecca A	Lawrie			Both
	David S	Willis			Both
	Frank J	Iacono			Both
	Donald W	Cibotti			Both
	Not Found	Not Found			Both
			Mower MD Norwood		Both
			BHF Printing Inc		Both
			Uno Restaurant Training Facility		Both
	Linda B	Gilbert			Both
	Mary M	Hayes			Both
	Lisa	Perrotta			Both
	Beverly D	Hoppe			Both
	Robert J	Girling			Both
	Dwaine R Sr	Gilreath			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Cathleen	Coyne			Both
	Cathleen	Coyne			Both
	Cathleen	Coyne			Both
	Not Found	Not Found			Both
			CJM Services		Both
	Not Found	Not Found			Both
			Carpet Concepts		Both
	Mohamed N	Soufan			Both
	Not Found	Not Found			Both
	Jane M	McGee			Both
	Julie S	Alexopoulos			Both
	John	Gillis			Both
	Antonio R	Barriera			Both
	Jeffrey N	Saber			Both
	Anne M	McDonald			Both
	Not Found	Not Found			Both
	Albert	Lottero			Both
	Richard A	Potts			Both
	Not Found	Not Found			Both
	Joseph W	Berry			Both
	John E	Conway			Both
	Charles S	Brown			Both
	Pamela M	Anderson			Both
	Ronald J	Vater			Both
	John J Jr	Lincoln			Both
	Mary A	Bradanesse			Both
	Not Found	Not Found			Both
	William H II	Krohto			Both
	John J Jr	Canney			Both
	Robert A Sr	Brown			Both
	Not Found	Not Found			Both
	Richard J	Hudson			Both
	Not Found	Not Found			Both
	Margaret M	Coleman			Both
	Not Found	Not Found			Both
	Helen M	Costello			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Jonathan P	Reale			Both
	Mary B	Reale			Both
	Kenneth K	Norcross			Both
	Brian N	Chisholm			Both
	Ronald J	Gilson			Both
	Pasquale	Cirillo			Both
	Judith A	Desmarais			Both
	Not Found	Not Found			Both
	Alfred L	Breen			Both
	Joel L	Roy			Both
	Mark J	Hoban			Both
	Barbara A	Aowen			Both
	Charles B	Hess			Both
	George S	Dimitriou			Both
	Michael M	Coppola			Both
	Not Found	Not Found			Both
			Everetts Buff N Stuff		Both
	Stephen P	Nashawaty			Both
	Helen	Nashawaty			Both
	Helen	Nashawaty			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Antonio	Cerqueira			Both
	Antonio	Cerqueira			Both
	Antonio	Cerqueira			Both
	Not Found	Not Found			Both
	Walter P	Martowska			Both
			Foods Home Market		Both
	Joy M	Christensen			Both
	Laura L	Lang			Both
	Not Found	Not Found			Both
	John M	Utorka			Both
	Not Found	Not Found			Both
	John	Dunne			Both
	C	Dunne			Both
	Frank J	Foley			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Jeanine	Giguere			Both
	Jeanine	Giguere			Both
	Anthony A	Wozniak			Both
			Norfolk Express Corp		Both
			Boston Productions Inc		Both
	Jeffery	Grow			Both
	Michael L	Immonen			Both
	Matthew J Jr	Twomey			Both
	George D	Polillio			Both
	Melissa	Redker			Both
	Paul F	Wanecek			Both
	Paul F	Wanecek			Both
	Paul F	Wanecek			Both
	Rob & Donna	Binnall			Both
	Rob & Donna	Binnall			Both
	Rob & Donna	Binnall			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Joaquim	Tibeiro			Both
	Joaquim	Tibeiro			Both
	Joaquim	Tibeiro			Both
	Karla	Garcia			Both
	Not Found	Not Found			Both
	Corrina	Giampietro			Both
	Not Found	Not Found			Both
	Richard P	Benjamin			Both
	Margaret L	Sostilio			Both
	Arnaldo F	Costa			Both
	William J	Doucette			Both
	Robert E	Boyle			Both
	Thomas G	Desario			Both
	Robert J	Clement			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Evelyn A	McCartney			Both
	Anthony J	Ketchel			Both
	Not Found	Not Found			Both
	Bruno	Mazzotta			Both
	Not Found	Not Found			Both
	Gerard R	Mansfield			Both
	Kathleen & James	Duchaney			Both
	Loretta & Keith	Braverman			Both
	Michael	Kaplan			Both
	Michael	Kaplan			Both
	John S	Bishop			Both
			Sanborn Glass Co		Both
			Sanborn Glass Co		Both
	Not Found	Not Found			Both
			Blue Hill Bath & Spa Inc		Both
			Blue Hill Bath & Spa Inc		Both
			Blue Hill Bath & Spa Inc		Both
			Blue Hill Bath & Spa Inc		Both
	John M Jr	Donnelly			Both
			Boston Cooling & Heating Co Inc		Both
			Boston Cooling & Heating Co Inc		Both
			Boston Cooling & Heating Co Inc		Both
			Boston Cooling & Heating Co Inc		Both
			Boston Cooling & Heating Co Inc		Both
			Boston Cooling & Heating Co Inc		Both
			Boston Cooling & Heating Co Inc		Both
			Boston Cooling & Heating Co Inc		Both
			Boston Cooling & Heating Co Inc		Both
	Paul B	Sparrow			Both
			Rush Auto Parts		Both
			Universal Carburetor		Both
			Neponset River House		Both
			Concepts In Financial Planning		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
			Anytime Any Place Locksmith		Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
			Ambulance Alert		Both
			Batco Automatic Transmissions		Both
	Not Found	Not Found			Both
			Certainteed Inc		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Anthony N	Scavotto			Both
	Kenneth M	Allen			Both
	Roy W	Schletzbaum			Both
	Not Found	Not Found			Both
	Hebert J III	Dias			Both
	Erik P	Bodenhofer			Both
	Elaine A	Doherty			Both
	Greg R	English			Both
	David	Chain			Both
	Not Found	Not Found			Both
	David R	Varon			Both
	Edward K	Hall			Both
	James O	Calvin			Both
	Melissa A	Farwell			Both
	Jochen	Carl			Both
			Healthcare Value MGT Inc		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Robert P	Derosé			Both
	Not Found	Not Found			Both
	Lynn N	Oleary			Both
	Amin R	Rasla			Both
	Peter P Jr	Gaigal			Both
	Ligia M	Rocha			Both
	Ligia Muniz	Rocha			Both
			South Norfo k County		Both
	William M	Kelley			Both
	William M	Kelley			Both
	William M	Kelley			Both
	Not Found	Not Found			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Jose	Dejesus			Both
	Jose A	Dejesus			Both
	Jose	Dejesus			Both
			Family Taxi Service		Both
			Family Taxi Service		Both
			Family Taxi Service		Both
	Courtney A	Rau			Both
	D	Pinkham			Both
	D	Pinkham			Both
	Claudette L	Burrell			Both
	Antero D	Branco			Both
	Antero	Branco			Both
	Antero	Branco			Both
	Jill A	Foley			Both
	Not Found	Not Found			Both
	Anne	O'Keefe			Both
	B	Doherty			Both
	Candido D	Silva			Both
	Kevin W	Mich			Both
	Howard M	Klein			Both
	M ke J	Dockray			Both
	B	Doherty			Both
	John	Drost			Both
	John	Drost			Both
	John	Drost			Both
	Not Found	Not Found			Both
			Tidy Solutions		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	William P	Oconnell			Both
	Jacklyn R	Pease			Both
	William P	Oconnell			Both
	Not Found	Not Found			Both
	David C	Thomas			Both
	V	Hartshorn			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	V	Hartshorn			Both
	Lisa	Branco			Both
	Jeanne P	Haldane			Both
	Dale M	Day			Both
	Not Found	Not Found			Both
	Carlos A	Fundora			Both
	David F	Barry			Both
	Michael	Murphy			Both
	Michael	Murphy			Both
	Michael	Murphy			Both
	Michael	Murphy			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Louise	Stupak			Both
	Michael J	Stupak			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Heather	Alix			Both
	Heather	Alix			Both
	J	Vitkauskas			Both
	J	Vitkauskas			Both
	J	Vitkauskas			Both
	Nicholas	Kourtis			Both
	Nicholas	Kourtis			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Jordan J	Harwood			Both
	Jordan	Harwood			Both
	Theresa	Bougouneau			Both
	Peter J	Bailey			Both
	Raymond S	Vitaitis			Both
	Raymond S	Vitaitis			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Janet	Palazzi			Both
	Janet	Palazzi			Both
	Janet	Palazzi			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Nutan K	Mathew			Both
	B M	Davis			Both
	Debra L	Sidorowicz			Both
	James E II	Brown			Both
	Tina	Ferrantino			Both
	Tina	Ferrantino			Both
	Tina	Ferrantino			Both
	Lisa	Twohic			Both
	Lisa	Twohic			Both
	Lisa	Twohic			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Marcia	Boyajian			Both
	Marcia	Boyajian			Both
	Gabi	Nicholas			Both
	Joe	Dickerson			Both
	Anthony R Jr	Grasso			Both
	Ruthann H	Smallwood			Both
	Hjean J	Frederick			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
			Chips Glass		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Terence L	Barrett			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Edward S Jr	Kniolek			Both
	Robert	McGuire			Both
	Robert	McGuire			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Frank	Anello			Both
	Frank	Anello			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Dan M	Goea			Both
	Elizabeth A	Barbosa			Both
	Deborah M	Hartnett			Both
	Not Found	Not Found			Both
	Germano J	Barbosa			Both
	Not Found	Not Found			Both
	John H II	Genga			Both
	Edmund J	Ferrara			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Edward V	Paduck			Both
	Edward V	Paduck			Both
	Edward V	Paduck			Both
	Melinda	Crowley			Both
	Melinda	Crowley			Both
	Melinda	Crowley			Both
	Juan	Sanchez			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Paul C	Gay			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Kenneth H	Webster			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Arlene	Harshell			Both
	Arlene	Harshell			Both
	Arlene	Harshell			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Linda A	Purpura			Both
	Sasanka S	Griddalur			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Durval	Vieira			Both
	Durval	Vieira			Both
	Theodore R	Campisano			Both
	Theodore R	Campisano			Both
	Meredith E	Pesta			Both
	G	Graham			Both
	G	Graham			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Matthew P	Whitcomb			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Charles A Jr	Crockett			Both
	Kurt	Welter			Both
	E	Cohen			Both
	Eva	Cohen			Both
	Edie H	Irvine			Both
	Amy	Shevory			Both
	Amy	Shevory			Both
	Amy	Shevory			Both
	Stephen W	Bastier			Both
	Edwin	Boughter			Both
	Edwin	Boughter			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Edward & Brenda	Zonfrillo			Both
	Edward & Brenda	Zonfrillo			Both
	Sean	Mausell			Both
	Sean	Mausell			Both
	Sean	Mausell			Both
	Paul H II	Sales			Both
	Joseph Jr	Antonelli			Both
	David M	Higgins			Both
	David M	Higgins			Both
	J	Springer			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Jillana	Podzka			Both
	Jillana	Podzka			Both
	Edson	Santos			Both
	Not Found	Not Found			Both
	Uziel	Desouza			Both
	Uziel	Desouza			Both
	Heberson	Lina			Both
	Heberson	Lina			Both
	Vandervelo	Melo			Both
	Elizabeth	Martins			Both
	D	Edwards			Both
	Donna M	Edwards			Both
	D	Edwards			Both
	Dennis W	Zablowski			Both
	K A	Morrison			Both
	Marie F	Polovitch			Both
	K A	Morrison			Both
	Joseph	Decosta			Both
	Joseph	Decosta			Both
	Joseph	Decosta			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Greg	Pucino			Both
	Amy	Pucino			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Rena M	Valeri			Both
	Not Found	Not Found			Both
	Amanda	Magallan			Both
	Amanda	Magallan			Both
	Amanda	Magallan			Both
	L	Arango			Both
	Not Found	Not Found			Both
	Walter E III	Miller			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Jarrold	McCarthy			Both
	Not Found	Not Found			Both
	Charles F	Reichert			Both
	Edward P	Dimartino			Both
	Ronald N	Squillante			Both
			JR Safety Crib Sheets Inc		Both
	Michael J	Murphy			Both
			Chamber Of Commerce		Both
			United Citrus Products		Both
			SCC Distr bution		Both
			Takara Belmont Usa Inc		Both
			Warehouses Merchandise		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Grace C	McMullin			Both
	Robert	Bunker			Both
	Elsa K	Randlov			Both
			Dollar Tree Stores		Both
			Bay State Wine & Spirits		Both
			Foxboro Transport & Contractin		Both
			Hannaford Supermarket		Both
			Norwood Animal Hospital		Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
			Liberty Tax Service		Both
			Sovereign Bank		Both
			A 1 Cleaning		Both
			Pre Design BLDG Co		Both
	Anthony F	Deban			Both
	Sarah	Concree			Both
	Nelson	Segundo			Both
			The Norwood Furniture Restorer		Both
	Geoffrey J	Rockett			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	John P	Madden			Both
	John P	Madden			Both
			BVF Windsor LLC		Both
	Jacinto	Pagan			Both
	Jacinto	Pagan			Both
	Jacinto	Pagan			Both
	Jacinto	Pagan			Both
	Jacinto	Pagan			Both
	Jesse E Sr	Cutler			Both
	Jacinto	Pagan			Both
	Jacinto	Pagan			Both
	Jacinto	Pagan			Both
	Olga I	Vargas			Both
	Jacinto	Pagan			Both
	Jacinto	Pagan			Both
	Jacinto	Pagan			Both
	Jacinto	Pagan			Both
	Jacinto	Pagan			Both
	Jackie	Duffy			Both
	Jacinto	Pagan			Both
	Not Found	Not Found			Both
	Richard J	Zabrowski			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	John	Zabrowski			Both
	Michael	Moroney			Both
	Michael	Moroney			Both
	Michael	Moroney			Both
	Michael	Moroney			Both
	Matthew M	Eysie			Both
	Donald	Groh			Both
			Amerecycle		Both
			Norwood Energy Corp		Both
			Allied Auto Parts Co.		Both
			Poirier Sales & Service Corp		Both
	Dean	Calusdian			Both
	Joseph S	Giordano			Both
			Apt Fitness Training		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Olga A	Abdallah			Both
	Paul J	Donohue			Both
	T A	Calmaza			Both
	T A	Calmaza			Both
	Not Found	Not Found			Both
			Learning Center For Marital Arts		Both
	Not Found	Not Found			Both
			Central Marketing & Travel		Both
	Joe	Gazerro			Both
	Joe	Gazerro			Both
	Joe	Gazerro			Both
	Joe	Gazerro			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Joe	Gazerro			Both
	Joe	Gazerro			Both
			Nicks Restaurant		Both
			Pizzas Galore		Both
	Not Found	Not Found			Both
	Matthew L	Rogers			Both
	Kathey	Inman			Both
	Kathey	Inman			Both
	Joan M	Shephard			Both
	Kathey	Inman			Both
	Kathey	Inman			Both
	Kathey	Inman			Both
	Kathey	Inman			Both
	Kathey	Inman			Both
	Not Found	Not Found			Both
			Cafe Venice		Both
	Not Found	Not Found			Both
			Norwood Portuguese Club		Both
	Vangelis &	Gjinis			Both
	Vangelis &	Gjinis			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Steven	McDevitt			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
			Neighborhood Market & Deli Inc		Both
	Gary B	Shade			Both
	Gregory	O			Both
	Gregory	O			Both
	Gregory	O			Both
	Gregory	O			Both
	Tom	Baker			Both
	Tom	Baker			Both
	Tom	Baker			Both
	Tom	Baker			Both
	Tom	Baker			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Tom	Baker			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Sara	Caban			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
			Hurley Communications		Both
	Elton E	Nanton			Both
	Not Found	Not Found			Both
	George	Gil			Both
			Norwood Laundry & Linen		Both
	Antonia	Howard			Both
	Not Found	Not Found			Both
	Pd	Andreassi			Both
	Pd	Andreassi			Both
	Not Found	Not Found			Both
	Brian J	Matthews			Both
	Pd	Andreassi			Both
	Pd	Andreassi			Both
	Pd	Andreassi			Both
	Not Found	Not Found			Both
	Neal M	Aronson			Both
	Neal	Aronson			Both
	Neal	Aronson			Both
	Neal	Aronson			Both
	Neal	Aronson			Both
	Neal	Aronson			Both
	Not Found	Not Found			Both
			Keegans Norwood Jewelers		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
			Schock Electric		Both
			Camber Insurance		Both
	Not Found	Not Found			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Kathleen M	Shaughnessy			Both
	Makhoul	Jreij			Both
			Fresh Bagel Cafe		Both
	Tammy	Hunt			Both
	Tammy	Hunt			Both
	Tammy	Hunt			Both
	Tammy	Hunt			Both
			Norwood Public Schools Balch		Both
	Not Found	Not Found			Both
	Melissa J	Lomberto			Both
	Melissa	Lomberto			Both
	Patricia E	Baker			Both
	Donna R	Montgomery			Both
	Melissa	Lomberto			Both
	Melissa	Lomberto			Both
	Lisa	Newell			Both
			Ace Locksmith & Security		Both
			Ace Locksmith & Security		Both
	Natasha	Stewart			Both
	Terry	Morani			Both
	Terry	Morani			Both
			A & J Automotive		Both
			Thrift Shop		Both
			A Bella Mia Flowers		Both
			A Bella Mia Flowers		Both
			A Bella Mia Flowers		Both
			A Bella Mia Flowers		Both
	Leo C	Dee			Both
			A Bella Mia Flowers		Both
			A Bella Mia Flowers		Both
			A Bella Mia Flowers		Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
			A Bella Mia Flowers		Both
			A Bella Mia Flowers		Both
			A Bella Mia Flowers		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Kent	Hurley			Both
	Kent	Hurley			Both
	Kent	Hurley			Both
	Baylson	Oliveira			Both
			Salon De Rosa		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
			Laplata Motors		Both
	Not Found	Not Found			Both
	D	Murray			Both
	D	Murray			Both
			Samhurst Inc		Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
			Convenient Food Mart		Both
	Edward G Dmd	Kornack	Kornack		Both
	Edward G Dmd	Kornack	Kornack		Both
	Edward G Dmd	Kornack	Kornack		Both
	Richard J	Lovell			Both
	Edward G Dmd	Kornack	Kornack		Both
	Kevin	Otoole			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	G	Farrell			Both
	G	Farrell			Both
	G	Farrell			Both
	G	Farrell			Both
			Kraw Kornack Funeral Home		Both
	Lauren G	Fraser			Both
			Chem Scientific LLC		Both
			Carols Auto Body		Both
			Brookside Cafe		Both
			Brookside Cafe		Both
			Brookside Cafe		Both
	Not Found	Not Found			Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
			Academy Of African American &		Both
	Luigi	Lorusso			Both
	Not Found	Not Found			Both
	Telma	Mendoza			Both
	Telma	Tobias			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Larry	Mastinggal			Both
	Not Found	Not Found			Both
	Allyson M	Langlois			Both
			Peters General Auto Repairing		Both
	Leroy	Lagrant			Both
	Maria R	Andrade			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Joseph N	Giampa			Both
	Joseph N	Giampa			Both
	Joseph N	Giampa			Both
	Susan M	Schumann			Both
	Susan A	Aliber			Both
	S A	Aliber			Both
	Choon C	Wong			Both
	Patricia	Wong			Both
	Vanessa	Dunaway			Both
	Vanessa	Dunaway			Both
	Vanessa	Dunaway			Both
	Kim V	Greene			Both
	Robert A	Silk			Both
	Paul L	Coughlin			Both
	William J	Monteith			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	James A Sr	Barss			Both
	Not Found	Not Found			Both
	Not Found	Not Found			Both
	Paul J	Silva			Both
	Veronica C	Thompson			Both
	Stephen L	Mills			Both
	Theodore N	Leotsakos			Both
	Joanne	Wolfe			Both
	Jane E	Phalen			Both
	Richard M Jr	Hinkson			Both
	Marcelo S	Figueiredo			Both

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	William N	Maher			Dam
	James A III	Cummings			Dam
	Michael A	Sobchuk			Dam
	Michael F	Walsh			Dam
	Irena	Rybicki			Dam
	Mary C	Maida			Dam
	Valda B	Straumens			Dam
			Curran John T & Associates		Dam
	Not Found	Not Found			Dam
	Paul F	Quigley			Dam
	Not Found	Not Found			Dam
	Not Found	Not Found			Dam
	David D	Norton			Dam
	David W	Froment			Dam
	Kimberly	Hanna			Dam
	Elaine	Vieira			Dam
	Dolores A	Medwar			Dam
	Joseph S	Barca			Dam
	Anthony L	Anderson			Dam
	Harun J Sr	Mustin			Dam
	Joseph F	Conlon			Dam
	Not Found	Not Found			Dam
	Janet H	Kelly			Dam
	Margaret A	Flood			Dam
	Paul L	Cleary			Dam
	Corey J	Pindel			Dam
	Not Found	Not Found			Dam
	Peter R	Bamber			Dam
			F A Cleveland School F A		Dam
	Norton	Fishman			Dam
	Stephen M	Lasden			Dam
	Stephen P	Konetchy			Dam
	Nelson N	Zapata			Dam
	Stephen J	Lynch			Dam
	Thomas F Jr	Foley			Dam
	Joyce	Gilroy			Dam

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Joyce	Gilroy			Dam
	Jose	Amorim			Dam
	Jose	Amorim			Dam
	Kristy	Morin			Dam
	Kristy	Morin			Dam
	Joseph W 3rd	Johnson			Dam
	Sally A	Oliverio			Dam
	Philip	Chelala			Dam
	Gary R	McPhee			Dam
	Paul K	Hajar			Dam
	John A	Roche			Dam
			Mobility Solutions		Dam
	Gregory T	Cahalane			Dam
	James E	Mansfield			Dam
	Gerald F	Miller			Dam
	Donald L	Whitcher			Dam
	Not Found	Not Found			Dam
	Michael B	Crowley			Dam
	Robert T	Parise			Dam
	Daniel J	Carroll			Dam
	Robert S	Holzman			Dam
	Janet M	Dunphy			Dam
	Kathi S	Rosenthal			Dam
	Michael G	Straehle			Dam
	Bruce O	Hadley			Dam
	Robert L	Irons			Dam
	David L	Metta			Dam
	Kenneth M	Hadge			Dam
	John A	Wynne			Dam
	Joseph K	Gilligan			Dam
	Ronald C	McCarthy			Dam
	Not Found	Not Found			Dam
	Warren M	Reid			Dam
	David	Esper			Dam
	Hayes M	Kelley			Dam
	Richard H	Jarrell			Dam

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Paul B	Shagoury			Dam
	Not Found	Not Found			Dam
	Denise M	Clark			Dam
	John S	Win			Dam
	Daniel B	Desatnick			Dam
	Stephen J	Martinho			Dam
			Temple Shaare Tefilah		Dam
	Richard M	Ehrlich			Dam
	William P	McCarthy			Dam
	Alexander B Jr	McDowell			Dam
	Geoffrey J	Stcyr			Dam
	Scott L	Kerns			Dam
			Knights Of Columbus		Dam
	William J	Ridge			Dam
	Sean E	McCarey			Dam
	Not Found	Not Found			Dam
	Gene N	Tenaglia			Dam
	Not Found	Not Found			Dam
	Abraham R	Shagoury			Dam
	Gerard C	Taggart			Dam
	Steven A	Epstein			Dam
	Brendan E	Seamans			Dam
	Keith R	Anderson			Dam
	Gerald E	Lyons			Dam
	James	Sinis			Dam
	Not Found	Not Found			Dam
	Michael C Jr	Loughran			Dam
	Michael J	Doliner			Dam
	Nancy J	Costa			Dam
			Ambulance Alert		Dam
	Not Found	Not Found			Dam
	Not Found	Not Found			Dam
			Performance Restoration		Dam
	Russell G	Hogan			Dam
	Richard G	Kadlick			Dam
	Patrick E	Lyons			Dam

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Linda J	Cohn			Dam
	Jose C	Neves			Dam
	Not Found	Not Found			Dam
	Scott T	Obrien			Dam
	Richard A Jr	Johnson			Dam
	Ryan	Boisclair			Dam
	Eugene W	Bamber			Dam
			North End Style Deli		Dam
	Renise	Fenelus			Dam
	Anne M	Valles			Dam
	Heather	Annis			Dam
	Ellis R	Wingett			Dam
	Thomas J	Bullard			Dam
	Brian M	Joyce			Dam
	Jane E	Regan			Dam
	Not Found	Not Found			Dam
	Theresa J	Spencer			Dam
	Theresa J	Spencer			Dam
	Robert J	Otoole			Dam
	Lana P	Johnson			Dam
	John W	Stampfl			Dam
	Not Found	Not Found			Dam
	Annette M	Grace			Dam
	Joseph E	Lynch			Dike
	Brian D Sr	Mulligan			Dike
	Richard J Jr	Talanian			Dike
	Not Found	Not Found			Dike
	Paul	Castellana			Dike
	Thomas J	Pickett			Dike
	Paul F	Dyer			Dike
	William F	Egan			Dike
	Not Found	Not Found			Dike
	Mary C	Bulger			Dike
	Orrin W	Gould			Dike
	Lou	Chaggaris			Dike
	Domenico V	Abruzzese			Dike

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Victor V	Bonaceto			Dike
	Maureen E	Fiece			Dike
	Scott	Cusack			Dike
	Matthew A	Puzey			Dike
	Charles C Jr	Decourcy			Dike
	Thomas J	Packard			Dike
	Frank R	Foye			Dike
	Joseph M	Gareri			Dike
	Paul E	Byrne			Dike
	Christino C	Helmas			Dike
	Jennifer	Carr			Dike
	Harry C Jr	Eaton			Dike
	William F	Shield			Dike
	Nicholas A Jr	Campagna			Dike
	Wilfrid J	Savoie			Dike
	James P	Buckley			Dike
	Gerard E	Sutherland			Dike
	Christine A	Gillis			Dike
	Peter W	Hirschfeld			Dike
	Vijay K	Joshua			Dike
	Judith A	Galle			Dike
	Gina	Dalton			Dike
	Jennifer	Elliot			Dike
	Edward A	Netland			Dike
	Christopher P	Bell			Dike
	Peter J	McSweeney			Dike
	Elaine J	Carey			Dike
	Not Found	Not Found			Dike
	Robert J	Ward			Dike
	Kenneth P	Johnson			Dike
	Edward R Jr	Spadoni			Dike
	Dominic F Jr	Frangioso			Dike
	Edward J Jr	Kerallah			Dike
	Not Found	Not Found			Dike
	Donald M	Whitney			Dike
	Laura M	Lanzoni			Dike

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	William F	Finn			Dike
	Winifred T	Harn			Dike
			Buyer Marion		Dike
	Stephen D Sr	Stogryn			Dike
	Milton & Eleanor	Connors			Dike
	Richard P	Foster			Dike
	Paul	Enos			Dike
	Xiaodong	Liu			Dike
	Thomas R	Benson			Dike
	Not Found	Not Found			Dike
	William J Jr	Riley			Dike
	David J	Abruzzese			Dike
	Elisabeth F	Cortese			Dike
	Louis J Jr	Taris			Dike
	Pietro	Digiulio			Dike
	Barbara L	Cronin			Dike
	David A	Clayton			Dike
	Paul F Sr	Obrien			Dike
	Rosalie M	Corkery			Dike
	Stanley L	Poon			Dike
	Frank	Fraone			Dike
	William R	Preskenis			Dike
	John T	Rampino			Dike
	Matthew A	Adams			Dike
	Giovanni	Fraone			Dike
	Maria J	Rodrigues			Dike
	Ginny	Twomey			Dike
	Ramji N	Sastri			Dike
	James E	Fitzgerald			Dike
	Augustino	Iarrobino			Dike
	Paul J	Russo			Dike
	Elliot L	Gilman			Dike
	Maria	Levin			Dike
	David J	Whelan			Dike
	Joseph P Jr	Carrozza			Dike
	Gail R	Sullivan			Dike


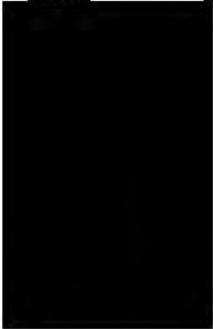
2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Stephen P	Dettoni			Dike
	Charles L Jr	Oconnell			Dike
	Michelle M	Berube			Dike
	Not Found	Not Found			Dike
	Joseph A	King			Dike
	Joseph A	King			Dike
	Kenneth H	Clark			Dike
	William J Jr	Plasko			Dike
	M key	Baker			Dike
	Michael J	McNamara			Dike
	Not Found	Not Found			Dike
			Dirty Dawg Wash, Inc.		Dike
			Rite Aid Pharmacies Norwood		Dike
	Robert J	Kilkus			Dike
			Motorsport Fabrication		Dike
	Not Found	Not Found			Dike
			Dunkin Donuts		Dike
	Joseph D	Haberlin			Dike
	Albert	Petrillo			Dike
	Valerie A	Johnson			Dike
			Pallis Kevin		Dike
	Not Found	Not Found			Dike
	Samantha	Pacheco			Dike
	Jean L	Lagalle			Dike
	Maura E	Boudrot			Dike
	Michael J	Capodilupo			Dike
	Shanna	Denehy			Dike
	Shanna	Denehy			Dike
	Not Found	Not Found			Dike
	Henry P	Gallant			Dike
	Gloria P	Johnson			Dike
	Not Found	Not Found			Dike
	Kim M	Allen			Dike
	Not Found	Not Found			Dike
	Sarah S	Hudgens			Dike
	Randy F	Pinto			Dike

2011 Willett Pond Inundation Contact List

NORWOOD Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Michael J	Brown			Dike
	Alexander	Dileo			Dike
	Kenneth A Jr	Cox			Dike
	Not Found	Not Found			Dike
	Joan M	Smith			Dike

2011 Willett Pond Inundation Contact List

WALPOLE Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	Charles	Malacaria			Dike
	John P Jr	Mustonen			Dike
	Regina B	Lafontaine			Dike
	Joe K	Kornack			Dike
	Richard H	Sonnenberg			Dike
	James A	Doogan			Dike
	C	Felix			Dike
	Not Found	Not Found			Dike
	George M Jr	Kent			Dike
	Peter J	Sullivan			Dike
	David N Jr	Lightbody			Dike
	David N Jr	Lightbody			Dike
	Gerard W	Murphy			Dike
	John	Bartkow			Dike
	Guy J Jr	Ferragamo			Dike
	Lee R	Lehto			Dike
	Frederick R	Kearney			Dike
	Not Found	Not Found			Dike
	Michael & Lina	Lencioni			Dike
	Daniel J	Dennehy			Dike
	John C	Roche			Dike
	Simon A	Nickels			Dike
	Andris R	Janson			Dike
	Not Found	Not Found			Dike
	John E	McChesney			Dike
	Joan M	Liotta			Dike
	Not Found	Not Found			Dike
	Roger J	Oginski			Dike
	Jennifer	Shammas			Dike
	Not Found	Not Found			Dike
	Kristen	Boch			Dike
	David J	Melish			Dike
	Anita	Lestan			Dike
	Gerard T	Oneill			Dike
	Peter & Victoria	Musto			Dike
	D	Maneikis			Dike

2011 Willett Pond Inundation Contact List

WALPOLE Properties to be evacuated in the event of ***Dam or Dike*** failure during 1/2 PMF.

<u>Parcel Address</u>	<u>First Name</u>	<u>Last Name</u>	<u>Business Name</u>	<u>Phone</u>	<u>Dam or Dike?</u>
	M	Cotter			Dike
	Not Found	Not Found			Dike
	Arthur J Jr	Jacovoni			Dike
	Not Found	Not Found			Dike
	Dennis G	Karageanis			Dike
	David N	Mackinnon			Dike
	Jan P	Skalicky			Dike
	Gloria M	Delisle			Dike
	Karlis	Bangerskis			Dike
	Richard	Johnson			Dike
	Daniel E	Perrault			Dike
	Joy J	Marchione			Dike
	Michael & Jody	Taylor			Dike
	Thomas A	Fritz			Dike
	Jeffery	Monat			Dike
	Edward J	Connolly			Dike
	John L	Spadazzi			Dike

Table A-2
FLOODWAVE DETAILS AT DOWNSTREAM CROSSINGS
FOR SPILLWAY DESIGN FLOOD (1/2 PMF) DAM BREACH*

	Distance Downstream (mi)	Time to Initial Floodwave Arrival (hh:mm)	Time to Peak Flood Arrival (hh:mm)	Depth of Overtopping (ft)
Walpole Street	0.75	0:05	0:35	6
Conrail Embankment (Hawes Brook)	1.3	0:15	2:15	1.3
Washington Street	1.7	0:40	2:20	7
Conrail Embankment (Neponset River)	2.2	0:45	4:00	-3.3
MA Route 1	2.7	0:50	5:20	-6.5
I-95	4.3	2:15	7:30	-18.5

Table A-3: FLOODWAVE DETAILS AT DOWNSTREAM CROSSINGS
FOR SUNNY DAY DAM BREACH*

	Distance Downstream (mi)	Time to Floodwave Arrival (hh:mm)	Time to Peak Flood Arrival (hh:mm)	Depth of Overtopping (ft)
Walpole Street	0.75	0:15	1:00	2.0
Conrail Embankment (Hawes Brook)	1.3	0:25	2:05	-4.9
Washington Street	1.7	0:35	2:15	0.7
Conrail Embankment (Neponset River)	2.2	0:45	4:20	-14.0
MA Route 1	2.7	0:55	4:30	-9.8
I-95	4.3	1:20	8:30	-21.0

* The basis for estimating the dam breach floodwave is described in Appendix C. Actual flood area, timing, and depths will vary.

Table A-4
FLOODWAVE DETAILS AT DOWNSTREAM CROSSINGS
FOR SPILLWAY DESIGN FLOOD (1/2 PMF) DIKE BREACH*

	Distance Downstream (mi)	Time to Initial Floodwave Arrival (hh:mm)	Time to Peak Flood Arrival (hh:mm)	Depth of Overtopping (ft)
Walpole Street	0.75	0:10	1:00	5.5
Conrail Embankment (Hawes Brook)	1.3	0:20	4:30	1.2
Washington Street	1.7	0:50	4:35	7.7
Conrail Embankment (Neponset River)	2.2	1:15	6:30	-2.7
MA Route 1	2.7	1:40	7:40	-6.4
I-95	4.3	4:15	9:30	-19.0

Table A-5: FLOODWAVE DETAILS AT DOWNSTREAM CROSSINGS
FOR SUNNY DAY DIKE BREACH*

	Distance Downstream (mi)	Time to Floodwave Arrival (hh:mm)	Time to Peak Flood Arrival (hh:mm)	Depth of Overtopping (ft)
Walpole Street	0.75	0:20	1:05	4.3
Conrail Embankment (Hawes Brook)	1.3	0:25	3:20	-11.3
Washington Street	1.7	0:40	3:30	0.5
Conrail Embankment (Neponset River)	2.2	0:45	5:15	-15.5
MA Route 1	2.7	1:00	5:45	-10.5
I-95	4.3	1:45	8:50	-21.4

* The basis for estimating the dam breach floodwave is described in Appendix C. Actual flood area, timing, and depths will vary.

Appendix B

Resources Available



Appendix B: Resources Available

Use the list below in order to locate assistance in implementing mitigation activities at the Dam or Dike. Begin at the top of the list and continue down until you reach someone who can respond promptly.

Kenny Jones Corporation, 202 Main St., Walpole has backhoes, excavators, rolls of 40 MIL HDPE poly membrane, and rocks.

Office: 508-850-5151
Cell: [REDACTED]

Colantuoni Bros. Construction, 77 Davis Avenue, Norwood has backhoes, excavators, and loaders. 30 ml poly, sand, and stone are available on short notice

Office: 781-255-1001

Norwood DPW Director Mark Ryan

Office: 781-762-1413
Cell: [REDACTED]
Radio: Via Norwood Police

Walpole DPW Director Robert O'Brien

Office: 508-660-7305
Emergency: Via Walpole Police

Appendix C

Investigation and Analysis of Dambreak Floods



Willet Pond Dam and Dike Dam Breach Analysis

Neponset River Land Holding Association
Canton, MA



317 Iron Horse Way, Suite 204
Providence, RI 02908

1.0 DAM BREACH ANALYSIS

1.1 General

A separate breach analysis was conducted for Willett Pond Dam and Willett Pond Dike. As is discussed in detail below, the possibility of the failure of additional downstream structures due to the “domino effect” was considered as part of each analysis.

1.2 Hydrologic Analysis

Per Section 302 CMR 10.14 (6)(a) of the regulations, a dam with a high hazard classification and a size classification of “Large” (302 CMR 10.06 (2)) must have sufficient hydraulic capacity to safely convey the peak discharge from $\frac{1}{2}$ the probable maximum flood (PMF). Therefore, the assessment of the potentially inundated areas assumes Willett Pond Dam and Willett Pond Dike are breached during the peak discharge from the $\frac{1}{2}$ PMF. For the purposes of this analysis the $\frac{1}{2}$ PMF was assumed to be equal to 50 percent of the hydrograph generated during the PMF.

The inflow hydrograph into Willett Pond was estimated using the methodology described in Technical Release 55 issued by the Natural Resources & Conservation Service, formerly Soil Conservation Service, (SCS 1986). A hydrologic model was created using the PondPack software package produced by Bentley Systems, Inc. Hydrograph routing was performed using the SCS Unit Hydrograph method. The estimated depth of rainfall for the probable maximum precipitation (PMP) is listed in Hydrometeorological Report 52 as 32 inches in a 24 hour period (Schreiner et. al 1978). A synthetic curve was used to simulate the temporal rainfall distribution which in accordance with the rainfall distribution recommended in Recommended Guidelines for Safety Inspection of Dams (USACE 1976). The CN values applied to the model were estimated to be 80 for residential areas, 65 for woods/fields, and 95 for wetland areas.

The hydrologic analysis report, including the rainfall distribution and runoff hydrograph, and a drainage area map are provided in [Appendix A](#).

1.3 Hydraulic Model

Each dam breach scenario was modeled using the HEC-RAS (River Analysis System) software package released by the U.S. Army Corps of Engineers. The breach formation parameters (i.e. width of the breach and time to full formation) were estimated using published guidance (Wahl 1998 & 2004). The breach progression, generation of the resulting outflow hydrograph, and routing of the hydrograph through the downstream reaches was performed using unsteady flow routing. The extent of the inundated areas was based on the peak water surface elevations in the downstream channel. Channel geometry used in the models was obtained from detailed cross-section data from the FEMA Flood Insurance Study (FEMA 1979), site measurements and observations, and from USGS topographic mapping. It should be noted that detailed cross-section information was available for Hawes Brook, but was not available for the effected reach of the Neponset River. Therefore, elevations of the Neponset River channel were obtained from flood profiles provided in

the FEMA Flood Insurance Study, and overbank elevations were obtained from USGS topographic mapping.

1.3.1 Hydraulic Model Results

The presence of the two large railroad embankments in the downstream reaches has a significant impact on the extents of the inundated area. Unlike bridges which tend to have large openings and, therefore, greater hydraulic capacity, the arch culverts at these structures are relatively small and have lesser capacity to convey large flows. Furthermore, the height and length of the embankments allows a large volume of water to be impounded behind these structures in the event that the culverts become overwhelmed. The design and construction specifications of these embankments are not known, however; structures such as this are not typically designed to safely impound water or to resist erosive forces in the event that they are overtopped.

The possibility of a failure of the Conrail embankment at Hawes Brook was included in the analysis because it appears that this structure could be overtopped. The breach was assumed to form near the left abutment because the overtopping depth is greatest in this area. However, the Conrail embankment at the Neponset River was not assumed to fail because the results of the model indicate that maximum water surface elevation upstream this structure would be approximately 4 ft below the crest.

Due to the magnitude of the flood waves and the extent of the inundated areas caused by the railroad embankments, the inclusion of dam breaches at the Norwood Fishing Club Dam, Ellis Pond Dam, and Soap Mill Pond Dam would have no material effect on the results of the analysis. Therefore, these structures were not breached in the model. Likewise, the bridge crossings at Walpole Street and Pleasant Street were not included in the model.

The breach formation parameters for each structure are listed below in [Table 1](#). The breach formation height is the depth of the breach measured from the maximum upstream water surface elevation to the final elevation of the bottom of the breach. The elevation of the bottom of the breach is dependant on downstream topography.

Table 1 - Breach Formation Parameters

Structure	Failure Mode	Breach Bottom Width	Breach Height	Full Formation Time
Willett Pond Dam	Overtopping	150 ft	24.1 ft	0.6 hr
Willett Pond Dike	Overtopping	135 ft	14.6 ft	1.0 hr
Conrail Embankment	Overtopping	111 ft	16.4 ft	1.0 hr

The results of the analysis are given in [Appendix B](#). The approximate limit of potential flooding due to a breach of Willett Pond Dam and Willett Pond Dike are shown in [Figure 1](#) and [Figure 2](#), respectively. The locations of channel cross-sections use in the HEC-RAS model are shown in [Figure 3](#).

Willet Pond Dam & Dike Dam Breach Analysis - Sunny Day Conditions

Neponset River Land Holding Association
Canton, MA

October 5, 2012



146 Hartford Road
Manchester, CT 06040

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Dam Breach Analysis – Sunny Day Conditions Neponset River Land Holding Association

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Following End of Report

1 Introduction

A breach analysis was conducted for Willett Pond Dam and Willett Pond Dike under the “sunny day” scenario. A sunny day dam failure occurs during non-flooding conditions and could be more catastrophic to the downstream area due to an unanticipated breach in the dam, which would not give time to warn downstream residents.

2 Hydrologic Analysis

This assessment of the potentially inundated areas assumes Willett Pond Dam and Willett Pond Dike are breached during the sunny day low-flow discharge under normal water surface elevations. For the purposes of this analysis, the base flow rate was assumed to be 125 cubic feet per second, which was selected as a conservative sunny day flow and to balance computational instabilities in the unsteady state flow model. Because a conservative base flow was applied to the analysis, the maximum post-breach water surface elevations and inundation areas are inherently more conservative as well.

3 Hydraulic Model

The sunny day breach scenarios for the Dam and the Dike were modeled using the HEC-RAS (River Analysis System) software package released by the U.S. Army Corps of Engineers. The breach formation parameters (i.e. width of the breach and time to full formation) were estimated using published guidance (Wahl 1998 & 2004). The breach progression, generation of the resulting outflow hydrograph, and routing of the hydrograph through the downstream reaches was performed using unsteady flow routing. The extent of the inundated areas was based on the peak water surface elevations in the downstream channel.

Channel geometry used in the models was obtained from detailed cross-section data from the FEMA Flood Insurance Study (FEMA 1979), site measurements and observations, and from USGS topographic mapping. It should be noted that detailed cross-section information was available for Hawes Brook, but was not available for the effected reach of the Neponset River. Therefore, elevations of the Neponset River channel were obtained from flood profiles provided in the FEMA Flood Insurance Study, and overbank elevations were obtained from USGS topographic mapping.

3.1 Breach Parameters

Dam failures during sunny day conditions are typically the result significant leakages through earthen embankments, which results in the loss of internal embankment material due to erosive forces. This condition is often referred to as a “piping” failure. This mode of failure was assumed for both the Dam and the Dike. The breach formation parameters are summarized in Table 1. The breach formation height is the depth of the breach measured from the maximum upstream water surface elevation to the final elevation of the bottom of the breach. The elevation of the bottom of the breach is dependent on downstream topography.

Table 1 - Breach Formation Parameters

Structure	Failure Mode	Breach Bottom Width	Breach Height	Full Formation Time
Willett Pond Dam	Piping	89 ft	24.1 ft	0.9 hr
Willett Pond Dike	Piping	79 ft	14.6 ft	1.5 hr

It should be noted that the earthen embankment at Willett Pond Dam and Dike include a concrete core wall along their entire length. If the core wall were to be in good condition, the likelihood of a significant leakage forming through the Dam would be minimal. However, the methods and materials used in the construction of the core wall are unknown; the present day condition of the core wall is also unknown. Although data collected during the 2010 Phase II inspection of the Dam and Dike indicate that the core wall is presently functioning well to prevent leakage through the embankment. The possibility of significant leakage forming through the structure in the future cannot be precluded and was applied to the failure analysis for the Dam and Dike. The breach parameters above were developed assuming an earthen embankment with no core wall. Given that the Dam and the Dike do have core walls, a sunny day could result in a breach formation that is less tall, less wide, or with a slower formation time when compared to the values listed above.

3.2 Hydraulic Model Results

The presence of the two large railroad embankments in the downstream reaches has a significant impact on the extents of the inundated area. Unlike bridges which tend to have large openings and, therefore, greater hydraulic capacity, the arch culverts at these structures are relatively small and have lesser capacity to convey large flows. Furthermore, the height and length of the embankments allows a large volume of water to be impounded behind these structures in the event that the culverts become overwhelmed. The design and construction specifications of these embankments are not known; however, structures such as this are not typically designed to safely impound water or to resist erosive forces in the event that they are overtopped.

The possibility of a failure of the downstream railroad embankments was evaluated as part of the sunny day failure analyses for the Dam and the Dike. The results of both of the failure analyses indicated that these structures would not be overtopped; therefore, it was assumed that these structures would not be breached.

Additionally, it was assumed that due to the magnitude of the flood wave and the extent of the inundated area caused by failure of the Dam or the Dike, the inclusion of dam breaches at the Norwood Fishing Club Dam, Ellis Pond Dam, and Soap Mill Pond Dam would have no material effect on the results of the analyses. Therefore, these structures were not breached in the model. Likewise, the bridge crossings at Walpole Street and Pleasant Street were not included in the model, as these areas would be inundated.

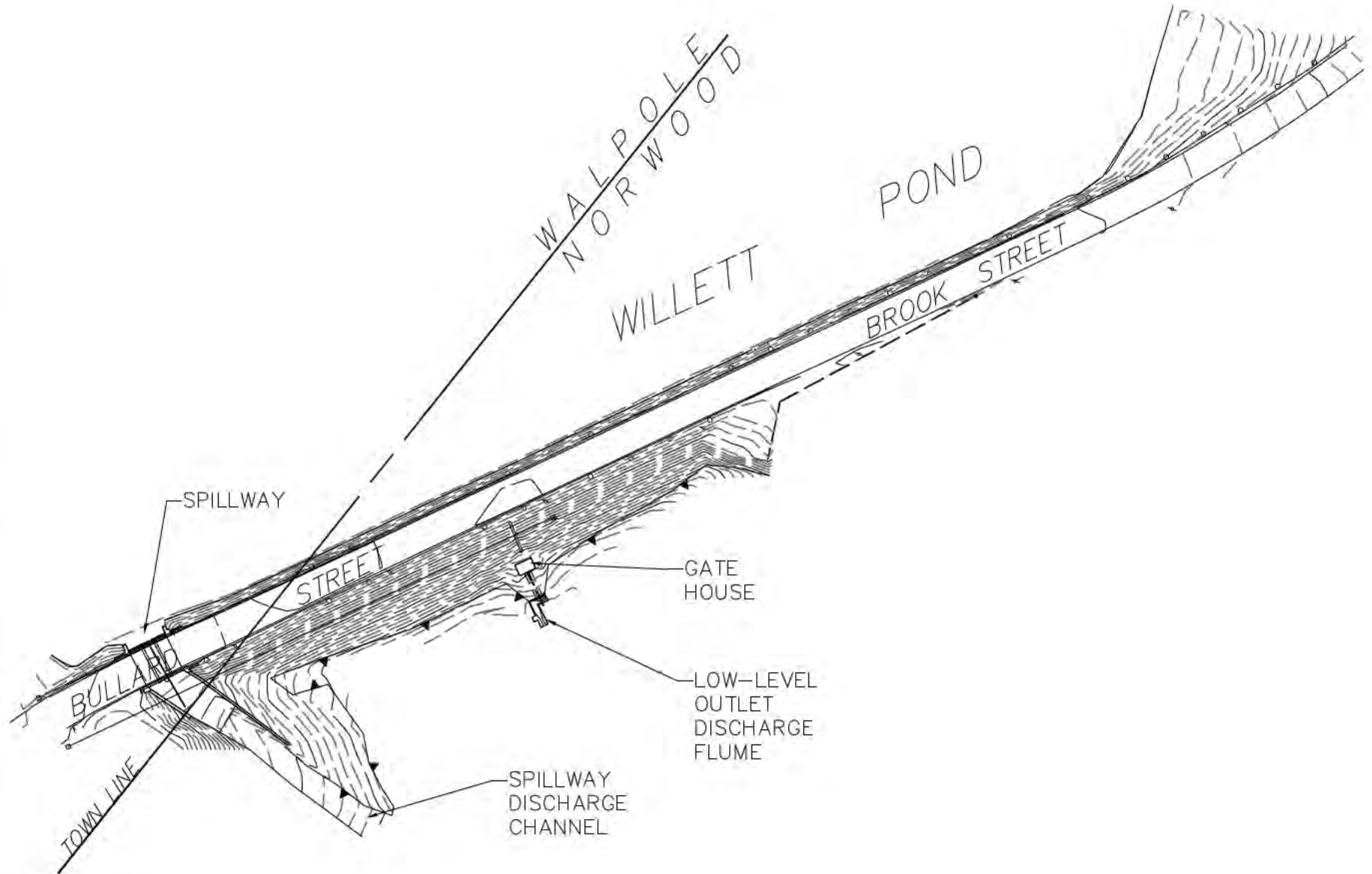
The approximate limit of potential flooding due to a breach of Willett Pond Dam and Willett Pond Dike is shown in *Figure 4A - 4B* and *Figure 5A - 5B*, respectively. The approximate arrival times of the post-

breach flood wave at various locations along the downstream reach are included on the inundations maps. The arrival times represent the time from the beginning of the breach formation to the initial increase in flow/water surface elevation at the given locations.

Appendix D

Engineering Plans of Dam





SCALE:	
HORZ:	
VERT:	
DATUM:	
HORZ:	
VERT:	
0	
GRAPHIC SCALE	



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860.646.2469

WWW.FONDQ.COM

NEPONSET RIVER LAND HOLDING ASSOCIATION

PHASE I - DAM - FIELD SKETCH

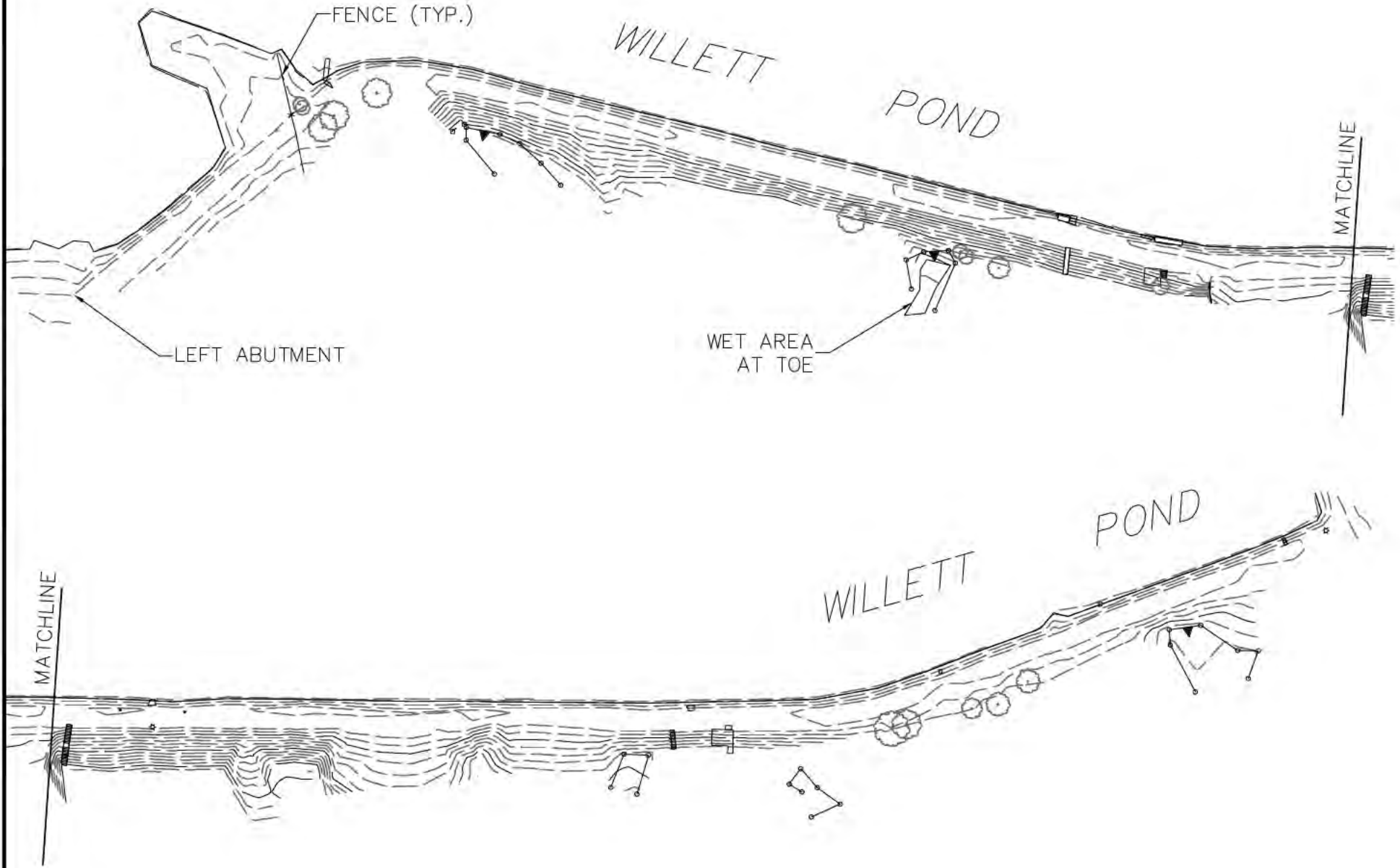
MA00169 - WILLETT POND DAM

NORWOOD/WALPOLE

MA

PROJ. No.: 20051323.A20
 DATE: 6/11/09

FIG.5



SCALE:	
HORZ:	
VERT:	
DATUM:	
HORZ:	
VERT:	
0	
GRAPHIC SCALE	



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NEPONSET RIVER LAND HOLDING ASSOCIATION

PHASE I - DIKE - FIELD SKETCH

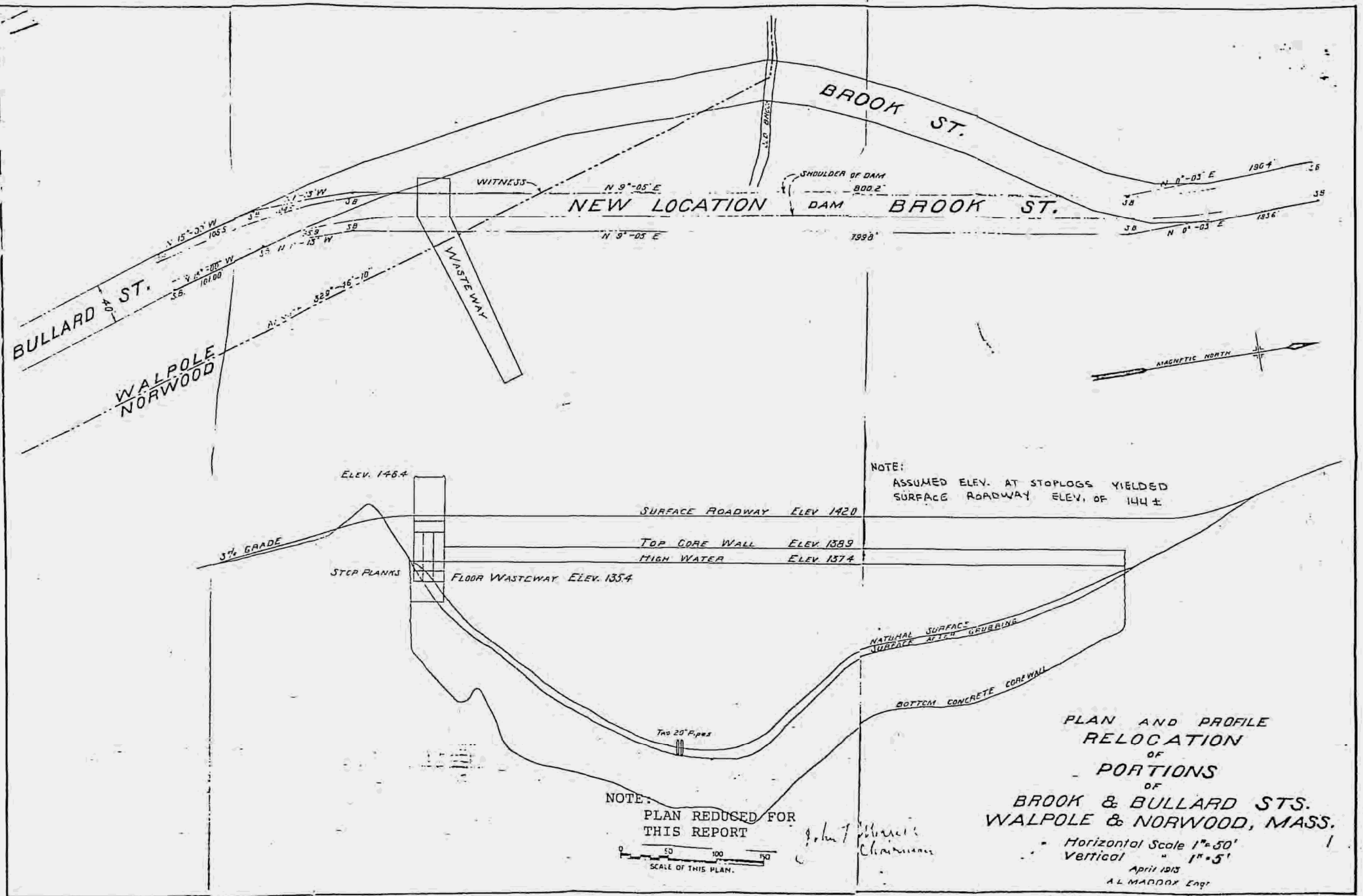
MA00169 - WILLETT POND DAM

NORWOOD/WALPOLE

MA

PROJ. No.: 20051323.A20
 DATE: 6/11/09

FIG.7



WILLETT POND DAM FIGURE B-4

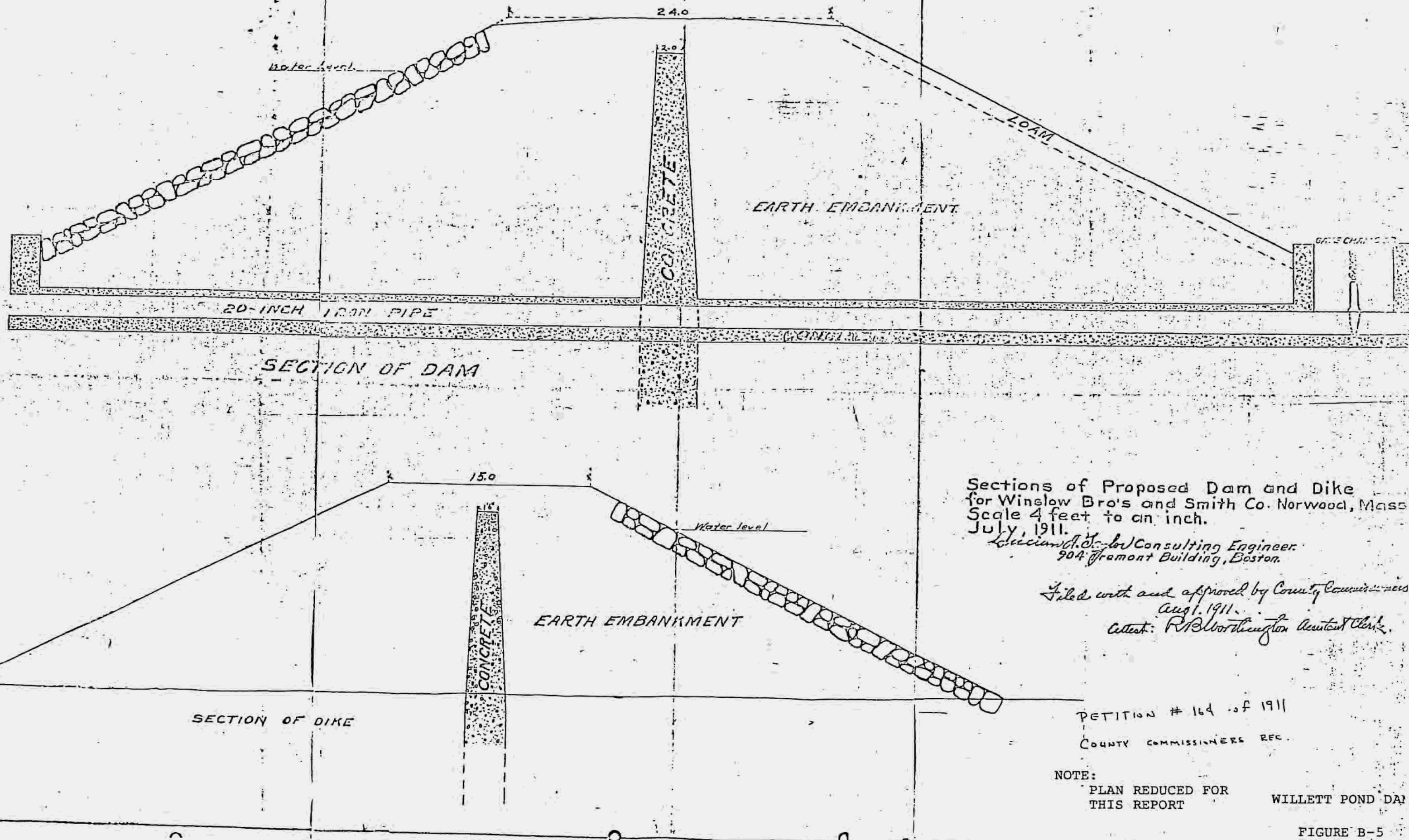


FIGURE B-5

Appendix E

Engineering Data for Dam



ENGINEERING DATA FOR DAM

Name: Willett Pond Dam
State Inventory ID #: 6-11-220-02
National Inventory of Dams ID #: MA00169

Per Current Regulations (302 CMR 10.06(2)): Large
Latest DCR Classification (1998 Department
of Environmental Management Inspection): Large

Per Current Regulations (302 CMR 10.06(2)): High Hazard (Class I)
Latest DCR Classification (1998 Department
of Environmental Management Inspection): High Hazard (Class I)

Dam Length: 900 feet
Dam Structural Height: 25 feet
Dam Hydraulic Height: 22 feet
Type of Dam: Earth Embankment with concrete core wall
Type of Spillway: Concrete Broad Crested Weir
Low-Level Outlet: Dual 20-inch cast iron culverts
with operable knife gates

Dike Length: 1,900 feet
Dike Structural Height: 14 feet
Dike Hydraulic Height: 11 feet
Type of Dike: Earth Embankment with concrete core wall
Type of Spillway: NA
Low-Level Outlet: NA

Appendix F

Record Holders of Record Copies of EAP



Appendix F: Record of Holders of Control Copies of EAP

Town of Norwood

Bernie Cooper, Assistant Town Manager and Emergency Planning Coordinator
Town Hall, 566 Washington St. Norwood, MA, 02062 bcooper@ci.norwood.ma.us

Town of Walpole

Roger Turner, Emergency Planning Coordinator
972 Main St., Walpole, MA, 02081 wlp1ema@aol.com

State Officials

Erica Heidelberg, EAP Reviewer, Massachusetts Emergency Management Agency
400 Worcester Rd., Framingham, MA, 01702 erica.heidelberg@massmail.state.ma.us

Office of Dam Safety, DCR
Attn: EAP Coordinator
180 Beaman St., West Boylston , MA, 01583

Private Individuals or Groups

Philip Moreschi, Vice President, Fuss and O'Neill Engineering,
146 Hartford Road, Manchester, CT 06040 pmoreschi@fando.com

Neponset River Land Holding Association
2173 Washington Street
Canton, MA 02021 cooke@neponset.org

Appendix G

Glossary of Terms





COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions refer to 302 CMR10.00 Dam Safety, or other reference published by FERC, Dept. of the Interior Bureau of Reclamation, or FEMA. Please note should discrepancies between definitions exist, those definitions included within 302 CMR 10.00 govern for dams located within the Commonwealth of Massachusetts.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.

Downstream – Shall mean the high side of the dam, the side opposite the upstream side.

Right – Shall mean the area to the right when looking in the downstream direction.

Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – Shall mean any artificial barrier, including appurtenant works, which impounds or diverts water.

Embankment – Shall mean the fill material, usually earth or rock, placed with sloping sides, such that it forms a permanent barrier that impounds water.

Crest – Shall mean the top of the dam, usually provides a road or path across the dam.

Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.

Appurtenant Works – Shall mean structures, either in dams or separate therefrom, including but not be limited to, spillways; reservoirs and their rims; low-level outlet works; and water conduits including tunnels, pipelines, or penstocks, either through the dams or their abutments.

Spillway – Shall mean a structure over or through which water flows are discharged. If the flow is controlled by gates or boards, it is a controlled spillway; if the fixed elevation of the spillway crest controls the level of the impoundment, it is an uncontrolled spillway.

Size Classification

(as listed in Commonwealth of Massachusetts, 302 CMR 10.00 Dam Safety)

Large – structure with a height greater than 40 feet or a storage capacity greater than 1,000 acre-feet.

Intermediate – structure with a height between 15 and 40 feet or a storage capacity of 50 to 1,000 acre-feet.

Small – structure with a height between 6 and 15 feet and a storage capacity of 15 to 50 acre-feet.



Non-Jurisdictional – structure less than 6 feet in height or having a storage capacity of less than 15 acre-feet.

Hazard Classification

(as listed in Commonwealth of Massachusetts, 302 CMR 10.00 Dam Safety)

High Hazard (Class I) – Shall mean dams located where failure will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s) or railroad(s).

Significant Hazard (Class II) – Shall mean dams located where failure may cause loss of life and damage to home(s), industrial or commercial facilities, secondary highway(s) or railroad(s), or cause the interruption of the use or service of relatively important facilities.

Low Hazard (Class III) – Dams located where failure may cause minimal property damage to others. Loss of life is not expected.

General

EAP – Emergency Action Plan – Shall mean a predetermined (and properly documented) plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam failure.

O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.

Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.

Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet.

Height of Dam (Structural Height) – Shall mean the vertical distance from the lowest portion of the natural ground, including any stream channel, along the downstream toe of the dam to the lowest point on the crest of the dam.

Hydraulic Height – means the height to which water rises behind a dam and the difference between the lowest point in the original streambed at the axis of the dam and the maximum controllable water surface.

Maximum Water Storage Elevation – means the maximum elevation of water surface which can be contained by the dam without overtopping the embankment section.

Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.

Maximum Storage Capacity – The volume of water contained in the impoundment at maximum water storage elevation.

Normal Storage Capacity – The volume of water contained in the impoundment at normal water storage elevation.



Condition Rating

Unsafe – Major structural*, operational, and maintenance deficiencies exist under normal operating conditions.

Poor – Significant structural*, operation and maintenance deficiencies are clearly recognized for normal loading conditions.

Fair – Significant operational and maintenance deficiencies, no structural deficiencies. Potential deficiencies exist under unusual loading conditions that may realistically occur. Can be used when uncertainties exist as to critical parameters.

Satisfactory – Minor operational and maintenance deficiencies. Infrequent hydrologic events would probably result in deficiencies.

Good – No existing or potential deficiencies recognized. Safe performance is expected under all loading including SDF.

* Structural deficiencies include but are not limited to the following:

- Excessive uncontrolled seepage (e.g., upwelling of water, evidence of fines movement, flowing water, erosion, etc.)
- Missing riprap with resulting erosion of slope
- Sinkholes, particularly behind retaining walls and above outlet pipes, possibly indicating loss of soil due to piping, rather than animal burrows
- Excessive vegetation and tree growth, particularly if it obscures features of the dam and the dam cannot be fully inspected
- Deterioration of concrete structures (e.g., exposed rebar, tilted walls, large cracks with or without seepage, excessive spalling, etc.)
- Inoperable outlets (gates and valves that have not been operated for many years or are broken)

Appendix H

Logs and Forms



Appendix H – Form 1

Contact Checklist

Willet Pond Dam and Dike, MA00169

Norwood and Walpole, MA

Date _____

The following contacts should be made immediately after the emergency level is determined (see pages 15-25 for guidance to determine the appropriate emergency level for a specific situation). The person making the contacts should initial and record the time of the call and who was notified for each contact made. See the *Notification Charts* tab for critical contact information and *Emergency Services Contacts* tab for contact information for other possible emergency services.

Emergency Level 1 (see page 9)	Person Contacted	Time Contacted	Contacted by
___ Dam Operator's Representative	_____	_____	_____
___ Dam Operator's Technical Representatives	_____	_____	_____
___ State Dam Safety Agency	_____	_____	_____

Emergency Level 2 (see page 19)	Person Contacted	Time Contacted	Contacted by
___ Dam Operator's Representative	_____	_____	_____
___ Dam Operator's Technical Representatives	_____	_____	_____
___ State Dam Safety Officials	_____	_____	_____
___ Incident Commander	_____	_____	_____

Emergency Level 3 (see page 20)	Person Contacted	Time Contacted	Contacted by
___ Incident Commander	_____	_____	_____
___ State Dam Safety Officials	_____	_____	_____
___ Dam Operator's Representative	_____	_____	_____
___ Dam Operator's Technical Representatives	_____	_____	_____

Appendix H – Form 2

Unusual or Emergency Event Log

(to be completed during the emergency)

Dam name: Willet Pond Dam and Dike, MA00169

County: Norfolk County

When and how was the event detected?

_____ Weather

conditions: _____

_____ General

description of the emergency situation:

Emergency level determination (1, 2 or 3?): _____ Made by: _____

Actions and Event Progression

Date	Time	Action/event progression	Taken by

Report prepared by: _____ Date: _____

Appendix H – Form 3

Dam Emergency Situation Report

(to be completed following the termination of the emergency)

Dam name: Willet Pond Dam and Dike

National Inventory of Dams (NID) No.: MA00169

Dam location: Norfolk and Walpole Norfolk County Mill and Bubbling Brook

(City)

(County)

(Stream/River)

Date: _____ Time: _____

Weather conditions: _____

General description of emergency situation:

Area(s) of dam affected:

Extent of dam damage: _____

Possible cause(s): _____

Effect on dam's operation: _____

Initial reservoir elevation: _____ Time: _____

Maximum reservoir elevation: _____ Time: _____

Final reservoir elevation: _____ Time: _____

Description of area flooded downstream/damages/injuries/loss of life: _____

Other data and comments:

Observer's name and telephone number: _____

Report prepared by: _____ Date: _____

Appendix I

Site Specific Concerns



Appendix H: Site Specific Concerns

There are no additional site-specific concerns identified for the Willet Pond Dam and Dike at this time. This section can be expanded to include new information as it becomes available, or based on the results of EAP reviews or training.

Appendix J

Water Management Plan



Willett Pond Dam/Dike Water Level Management Plan

Overview

Flooding is the most likely cause of an emergency condition. This water level management plan provides a quick reference for the procedures for managing a flooding event.

Weather Monitoring

NRLHA staff monitor weather forecasts on a daily basis.

When the National Weather Service (the “NWS”) issues a Flood Watch or Flood Warning for the area, NRLHA staff begin closely monitoring NWS quantitative precipitation forecasts, real-time precipitation data and weather radar, at least once every four hours.

Once the NWS forecasts precipitation accumulations of 5 or more inches over 24 hours, the spillway is inspected at least once every 8 hours to check and record water levels and confirm that the spillway is clear.

These precipitation thresholds are conservative given that a 2015 analysis by Fuss and O’Neil estimates that the spillway may pass the runoff from a 500 year storm (~11.5 inches/24 hours) with the valves closed and stop logs in place.

Water Release Management

1) Opening Valves

When weather forecast data indicate that that prolonged heavy rainfall (>5” per 24 hours) is not only possible but EXPECTED, the NRLHA will notify the Norwood and Walpole Emergency Managers that a “Level 1 Non-Emergency Unusual Condition” exists and that the two 20-inch gate valves in the dam will be opened. As a courtesy, NRLHA will also notify the Commerce Center and Colantuoni Brothers Construction.

2) Removing Boards

When water is observed to be 1 foot over the stop logs, AND water levels are continuing to rise OR continued heavy precipitation is expected, the NRLHA will (if possible) notify Norwood and Walpole Emergency Managers that stoplogs will be removed, and will place the NRLHA’s engineering consultant on notice. The NRLHA manager will make a judgment as to whether to remove some or all of the stoplogs. Depending on the weather forecast, NRLHA may decide to remove some or all stoplogs before water is one foot above “normal.”



Removal of the stoplogs requires wading onto the upstream apron of the spillway from Bullard Street and using a socket wrench, breaker bar or similar tool to remove the clamps which are held in place by 15/16" hex bolts. A straight-claw hammer or pry bar is then used to lift out the stoplogs. NRLHA personnel have removed the stoplogs comfortably while wading with as much as 17 inches of water flowing over them. Although this task can be performed solo it is preferable to have a second person on hand, and to rig a safety line between the bridge and the person wading.

3) Dike Overtopping is Possible

Once some or all of the stoplogs have been removed, water levels and weather forecasts will continue to be monitored, to evaluate whether additional boards (if any) should be removed.

If all the stoplogs have been removed and the change in pond level combined with the precipitation forecast suggest that overtopping of the Dike may be possible, the NRLHA will notify the Norwood and Walpole Emergency Management Coordinators and the NRLHA's engineer that "Level 2 Early Warning Potential Dam/Dike Failure Situation" exists.

NRLHA staff will use their best judgement to determine when to initiate this action, but will generally consider a Level 2 condition to exist when all the boards have been removed and the water level has continued to rise to or beyond 1.5' above the top of the stoplogs (when installed) which is equivalent to approximately 1.1' to 1.9' below the top of the dike.

NRLHA will evaluate what equipment and supplies may be needed to respond to the situation if it continues to develop and confirm the availability of needed resources. These needs may include: sandbags, sand, rip-rap, geotextile or heavy plastic sheeting, backhoe or excavator, emergency lighting and or generators, among other potential items.

4) Dike Overtopping Likely or Imminent

If water levels continue rising within less than one foot of the top of the Dike and significant additional rain is forecast, NRLHA staff will mobilize equipment and supplies to the Dike to establish an improvised emergency spillway.

One of two potential strategies for establishing the emergency spillway should be selected. Both strategies should be implemented at a location on the dike with a low structural height, generally either the northern end or extreme southern end of the dike.

The first option is to channel water to a protected emergency spillway by placing sandbags along the rest of the length of the dike. The second is to create an improvised emergency spillway by excavation.

Sandbags are the strongly preferred alternative as they do not require disturbing the dike structure and they will maximize the available time before the dike begins to overtop. Sandbags can be placed along the entire Dike (i.e. without an improvised spillway) but the water level should not be raised more than 1 foot above the normal top of the Dike in order to prevent overtopping of the dam. Assuming a 200' improvised spillway, it will require approximately 1,700 standard sandbags to raise the dike by 4", 5,000 bags placed in a single three bag high stack to raise the Dike 1' or 10,000 bags placed in a more robust six bag pyramid formation to raise the Dike 1'. Bags should be placed first in areas of the dike with the greatest structural height.



Where there is not sufficient time, equipment or manpower to place sandbags, and failure of the Dike in an area of tall structural height is imminent or occurring, it may be desirable to improvise an emergency spillway through excavation in an area of low structural height rather than allowing an uncontrolled breach in an area of greater structural height.

Irrespective of which option is selected, the improvised emergency spillway should be reinforced against erosion to the extent possible by spreading a geotextile erosion control blanket or heavy gage (ideally 30 ml) polyethylene sheeting underwater on the upstream (reservoir) side of the Dike and anchoring it in place with sandbags or riprap. Then the sheet should be spread up and over the crest of the dike and down the back side of the structure. Finally the downstream end of the sheet should be held in place with additional ballast material.

At some point during this process as water levels continue to rise, NRLHA staff will notify the Norwood and Walpole Emergency Coordinators that they have declared a Level 3 Final Warning Urgent Dam Failure Appears Imminent or is in Process emergency. NRLHA staff will use their best judgement regarding when to make this determination, but it would generally be triggered when flows first begin to overtop the Dike, or immediately before creating an improvised spillway by excavation.

5) **Critical Elevations**

Spillway Floor:	137.8 feet
Top of Stop Logs:	139.9 feet
Top of Dike:	142.5-143.3 feet
Top of Dam:	145 feet